Northern California's Computer Magazine January 2, 1995 • #132 FREE

MICROTIMES™

The Eighth Annual MicroTimes 100

Movers, Shakers, Good Citizens, And Others Who Made A Difference In The Computer Industry In 1994

Culture Clash: 1994 In Review

MAN OF THE YEAR

Netscape's Marc Andreessen

"The net is a communication medium, it's a channel. There are no restrictions over what can go over it, what you can do on it."

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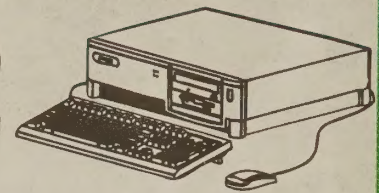

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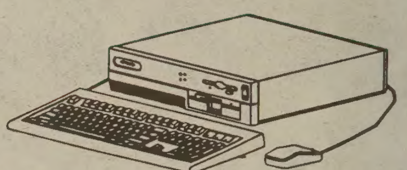

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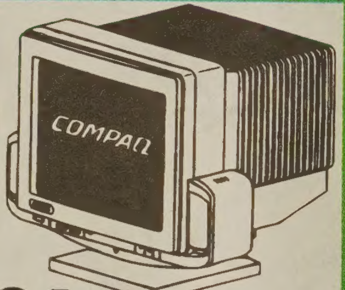

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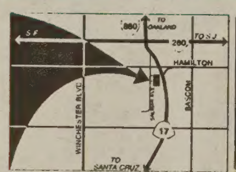
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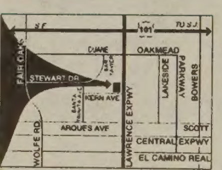
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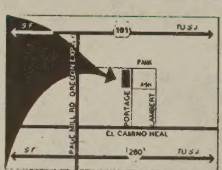
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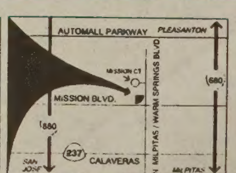
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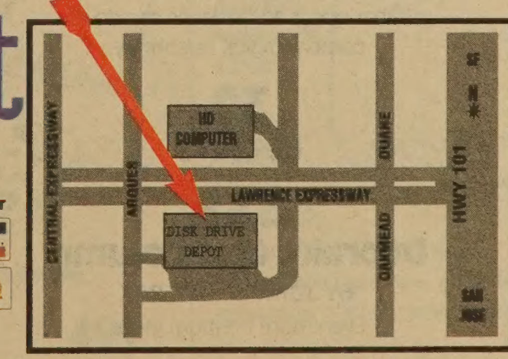

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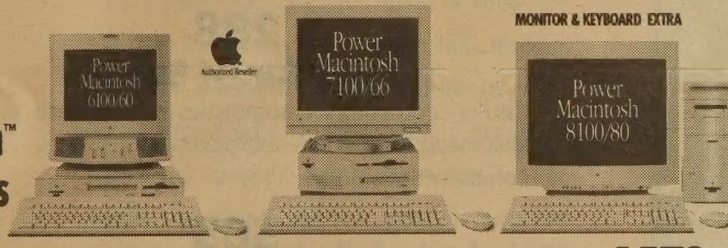

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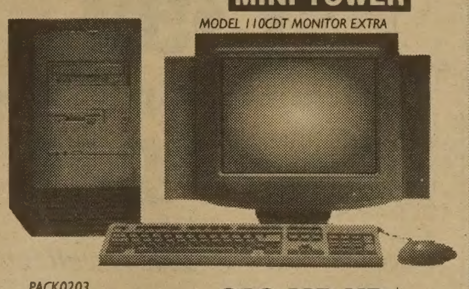

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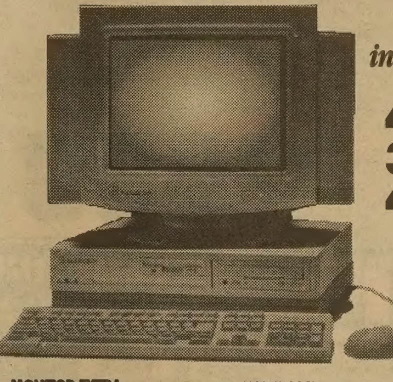

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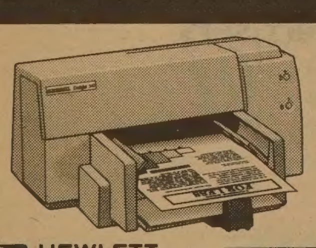

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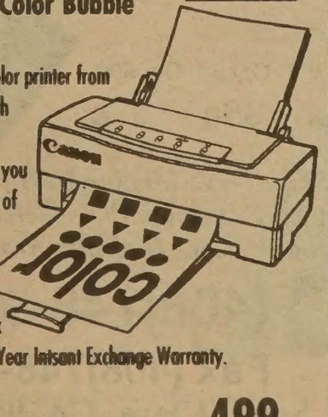

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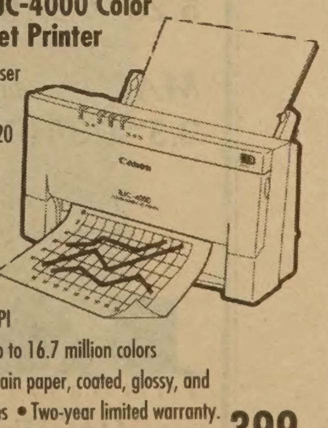

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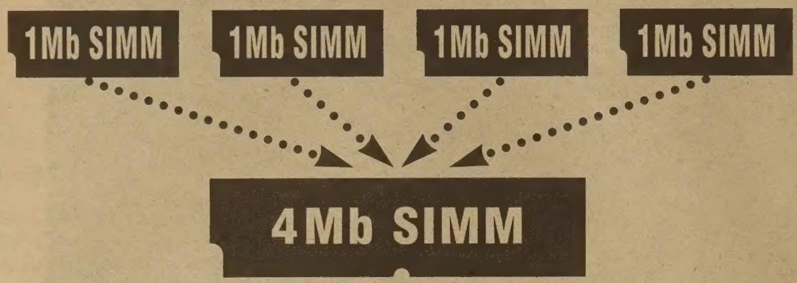

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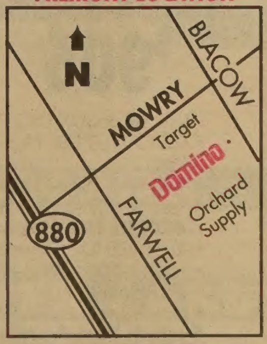

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- Intel 486DX2/DX4 Processor
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- 3 VLB-Bus 7 16 Bit ISA Slots
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- VESA Local Bus Windows Display Card w/1MB
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- 9.5" Upgradable 64GS, DSTN or TFT Color
- Detachable 2.5" Hard Drive & 1.44MB Slim Floppy
- Removable 86 Key Keyboard & 20mm Trackball
- Two Type II & One Type III
- Sound Blaster Compatible Audio System
- Ser., Par., PS/2 Mouse, Keybd, EXT VGA, MIC, Line in/out & Dock Ports
- Primary Ni-MH Battery (Secondary Option)
- 90V-265V AC/DC Adapter & 5.3lbs to 6.1lbs w/Battery
- Multi-Purpose Carrying Case

	486DX2-50MHz 4MB RAM/250MB HD	486DX4-75MHz 4MB RAM/340MB HD
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Dual Scan Color	$2125	$2635
Active Matrix Color	$3295	$3495

MDS MODEL 9200

NEW
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- 250MB Hard Drive (340MB, 520MB Optional)
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- One Type IV Slot (Two Type II/One Type III + One Type II)
- Sound Blaster Compatible Audio System
- Ser., Par., PS/2 Mouse, Keybd, EXT VGA, MIC, Line in/out Dock Ports
- Ni-MH Battery & 90V-265V AC/DC Adapter; 2 Hours Quick Charger
- Multi-Purpose Nylon Carrying Case, 6.6lbs w/Battery

	486DX2-66MHz 4MB RAM/250MB HD	486DX4-100MHz 4MB RAM/250MB HD
64GS MONO	$1625	$2145
Dual Scan Color	$2195	$2595
Active Matrix Color	$3095	$3495

PATRIOT 4000

- Intel SL-Enhanced 486SX-25/33, DX33/66
- 8K Burst Cache Built in, 4MB RAM (8, 16, 20, 32MB Optional)
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Dual Scan Color	$1955	$1985
Active Matrix Color	$2959	$2995

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Conner 540MB SCSI	$299
Conner 1.0GB SCSI	$595
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NEC 3XI Triple Speed Int. SCSI (195ms)	$415
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Rich Karlgaard is the editor of *Forbes ASAP*.

David Morgenstern works at *MacWEEK* and volunteers at BMUG.

John S. Quarterman (jsq@tic.com) is the senior technical partner of TIC (Texas Internet Consulting) and editor of *Matrix News*. He is a longtime observer, consultant, and writer on the matrix of electronic networks.

David A. Simon, CPA (M.S., Taxation) is in tax and accounting practice in Oakland, and is coauthor of *Business Contracts: Forms and Tax Analysis* (Wiley Law Publications). His clients include professionals and businesses throughout the state. He can be reached at (510)893-5753.

John C. Dvorak is a prolific author on many computer-related subjects and a collector of Internet humor.

Bruce Sterling, despite a brief foray into the computer field with *The Hacker Crackdown*, is a science fiction writer.

Jim Warren (jwarren@well.sf.ca.us) organized and chaired the First Conference on Computers, Freedom & Privacy (1991), received the Electronic Frontier Foundation Pioneer Award in its first year (1992), led the recent successful effort to make state legislation and statutes available via the public nets without state charge, and received the James Madison Freedom-of-Information Award from the Society of Professional Journalists—Northern California (1994). He also serves on Autodesk's board of directors.

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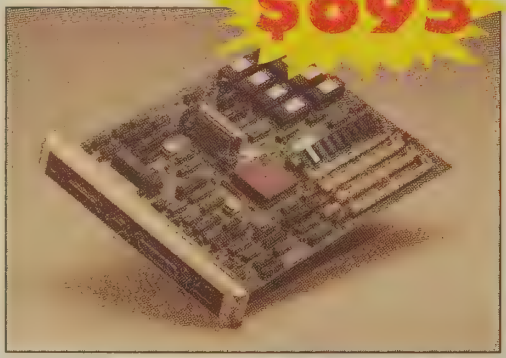

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BY PAUL HOFFMAN

Industry Insight

Intel Gets A Dose Of Bad Publicity
The Ripple Effects Of The Pentium Problem

A recent well-publicized bug in the Pentium processor's floating-point math unit has unnecessarily scared many users and caused Intel a great deal of woe.

Starting with a discussion on a few Usenet news groups on the Internet, the debate about the seriousness of the problem grew incredibly quickly. Possibly everyone's looking for something to talk about, or to worry about, because the bug would actually affect only a very small number of Pentium users. On the other hand, Intel's response is probably a much larger concern.

A Specialized Bug

Essentially, the problem only appears if you divide by a few specific numbers using the floating-point routines in the Pentium, and you require that the result be highly accurate. As you might imagine, very few typical Pentium users have this situation come up very often. The vast majority of users who use floating-point math need calculations that can be quite inaccurate by CPU standards. In such fields as accounting, it is incredibly more likely that you will get detectable errors from data entry than from this bug in the CPU.

This is not to say that there aren't people for whom the bug is serious. People doing simulations using large numbers of calculations could definitely be affected by the bug, and they have been the most vocal in their anger at Intel. Many expressed anguish at the idea that they will have to run their calculations again on different systems, such as 486s or PowerPCs, or on newer Pentiums that have the bug fixed.

Unfortunately, they are missing one very important point: Who's to say that those CPUs don't also have other obscure floating-point bugs that won't be found until later? It's not like Intel forgot to test the chip before they started manufacturing, but simply that they did not (some would say, could not) find all the floating-point problems through exhaustive testing.

In fact, no one noticed the bug in the first few revs of the Pentium processor, used in many millions of systems. As Intel points out, they tested the floating-point math routines in the Pentium harder than they had any other CPU because they changed the algorithms from the 486 CPU and wanted to be sure to catch whatever they could during the processor's design. After the processor had been out a year, they found the bug, and were able to classify how to reproduce it. They changed the design of the silicon that goes into the Pentium to fix the bug, but didn't alert anyone of the bug and didn't identify the new chips as being any different from the old ones. Intel has a stated policy of not announcing any such bugs, even to the technical trade press.

Intel's Attitude

This last bit is where Intel got into serious hot water when the bug was reported in the outside world. People who didn't understand how rare the bug is, or didn't believe that it was so rare, were furious that they might have bought a "bad" processor. Intel's assurances that the bug would only happen once in nine billion floating-point divides (again, something that few typical users ever do with the precision needed to find the bug) didn't seem to make anyone happy. The fact that you don't know whether buying a new Pentium system would fix the problem (it might have an old CPU in it) makes the anguish worse for these people.

> Intel's statement that it would replace the CPUs for the people who "need" them probably got people angrier than anything.

Intel's next statement, that it would replace the CPUs for the people who "need" them, probably got people angrier than anything. What people were most upset about was not knowing which calculations that they had performed (if any) had gotten wrong results. They paid good money for their machines, and they want ones that are always "right." To be told that they had to prove to some Intel engineer that they were performing "enough" floating-point divides with high degrees of precision was too much, and talks of lawsuits appeared in most of the online discussions.

As Michael Slater, publisher of the industry magazine *Microprocessor Report*, points out, Intel's lack of announcement leaves those people who were indeed affected by the bug in a terrible situation. Because of the bug's nature, any results that have been generated by machines with the problem are now suspect and probably have to be redone. If Intel had made the announcement in a timely fashion, these people could have saved months' worth of work. This may only be a few hundred or thousand people, but they are working all over the world on software problems that are quite critical for things like building and transportation safety. They can redo their work on newer systems without the flawed Pentium, but it will mean a great deal of aggravation and lost work.

Ubiquitous Bugs

On the other hand, should these people have been completely trusting their Pentiums in the first place? Just because this has been the only announced flaw, it doesn't mean that it is the only flaw that Intel has found. Nor does it mean that

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other CPUs that they might have used instead were not flawed in some other subtle but significant way. Some CPU manufacturers announce bugs of this nature, others do not.

As Slater points out, this kind of bug could not exist in most RISC CPUs because the whole idea of RISC is to reduce the number of instructions that the CPU can perform, and few if any RISC CPUs do floating-point divides. Instead, they leave that to system software. At first, this may seem like a good argument for switching to RISC CPUs. On further thought, however, it becomes clear that the exact same subtle bug could have appeared in the operating system or compiler software as it did in Intel's silicon. Sure, it would be easier to replace the software than the CPU, but it is also much more likely that Intel would have found the bug than, say Microsoft. Intel tests its floating-point routines by setting up dozens or hundreds of PCs running and checking every possible combination: What is the chance that an operating system vendor or a compiler vendor uses the same diligence?

What the current issue brings to light is the fact that CPUs are just as much software as software is. The Intel bug might have been caused by faulty logic on a programmer's part, just like faulty logic that exists in almost all of the software that we run every day. The bug could have also been introduced by accident in the translation from software to silicon, just as software manufacturers often find bugs that appear not in their code, but in a faulty compiler during the translation of their programming code into machine language.

What's A Pentium User To Do?

Regardless of where the bug appeared, it is clear that it only affects a very small number of Pentium users, but it might affect those few users in a serious fashion. Worse yet, there is no visible way of telling whether or not the bug exists on your system: you have to run a test program and examine the results. Intel chose not to change the look of the Pentium with the fixed code because they didn't want anyone to know that the bug existed in the first place. They (probably correctly) predicted that people would overreact to the announcement, and therefore didn't make any external change to the new Pentium chips. This means that people buying Pentium systems by mail order are at a significant disadvantage to those who can stand in the store and run the test before buying.

This leads to another very difficult problem: How can Intel rectify the problem for those few people they do swap CPUs for? You can't just pop open your PC and pull out the Pentium. For one thing, the physical design of the Pentium and many other modern CPUs makes it much harder to insert and remove than the old 386s. You need special tools to do this, meaning that you would have to take the computer to the store where you bought it or ship it to their repair depot. Assuming that the technical people at your dealer could handle the replacement (not a good assumption), you would still probably be without your computer for many days. Also, how likely is it that your dealer would want to do this for you for free? The defect was Intel's, not theirs, or so their logic might go.

What Intel failed to see is how our current mania with precision could make people worry more about some obscure bugs than more likely situations like bugs in software and misreading the screen. People have started to see their computer as part of their being, and if a part of their being has even tiny symptoms of flaws caused by external sources, they will often attack it without regard for the side effects, all the time ignoring other larger flaws that come from inside.

Those people wanting Intel to "fix it" for them when there are likely to be much larger systemic problems that they are ignoring are not that different from those who try to fix political problems by changing the politicians in Congress instead of just admitting that the problems will require personal attention from all of us.

Not that this leaves Intel with many options. It is likely that Intel will choose to replace whole systems for some people, or just the motherboards for others. Either way, it is likely that you will have to prove to Intel that you need the replacement. They can't replace everyone's CPU, and they shouldn't.

They could have been more honest about the problem when it first arose, and spent time proving that it wouldn't affect almost everyone. They could have been more honest all along about the fact that all CPUs have errors, but they're much less likely to be serious than normal software errors. If they had been more candid earlier, they wouldn't be put in their current ugly situation. ■

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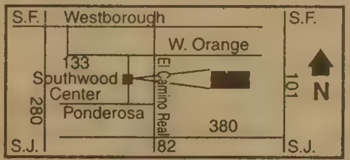

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Industry Insights *continued*

Shell-Shocked Investors Unload Stocks En Masse

Shareholders headed for the hills last month in a mass exodus that left US stocks staggering in its wake. A quick glance at the stocks in the accompanying table shows a group of high-tech stocks that were beaten black and blue. And nowhere was this beating more evident than in the MicroTimes Stock Index, which fell 108.09 points, or 1.97%, before calling it quits at 5370.37. In comparison, the Dow Jones Industrial Average fell 67.96 points, or 1.75%, before coming to rest at 3807.19. The reasons for the dramatic sell-off last month: heightened worries about a slowing national economy coupled with fears that higher interest rates will hurt corporate America's profits.

Borland's share price fell another 20.2% on top of its previous monthly loss of 15.2% before it finally came to rest at $8.38, but not before it hit a new 52-week low of $8.13 during the period. The stock, which once traded as high as $83 a share two years ago, is now at historically low levels. Borland's latest setback: the company is having trouble selling its dBASE for Windows program. For the trading period, Borland was the largest percentage-loser of the lot.

AST Research, in stark contrast, rallied a robust $2.50 a share, or 20.6%, en route to a close of $14.63. The stock rallied amid bullish comments from Oppenhiemer & Co. analyst Jim Pyner, who said, "The odds of them returning to profitability in the March quarter looks pretty good. The stock is still the best buy in the group." AST is the sixth-largest PC maker in the country. AST's stock traded at $33 in February of 1994.

MCI Communications traveled a southerly route, falling $4.25 a share, or 18.9%, to conclude matters at a new 52-week low of $18.25. Last month, Prudential Securities analyst Michael Elling began coverage of the company by issuing a "hold" recommendation. MCI Communications was the recipient of a "hold" rating because it faces regulatory hurdles in its attempt to enter the local phone market, among other issues. Said the analyst, "Near-term regulatory and wireless uncertainties, combined with an ambitious capital program and slowing unit growth" led to the neutral opinion. ■

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 10/27/94	CLOSING PRICE 12/16/94	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
OTC	Adobe		ADBE	36.38	33.50	-2.88	-7.90	24	0.20	0.60	38.50	19.75
OTC	Autodesk	(H)	ACAD	33.88	38.25	4.38	12.92	29	0.24	0.63	40.00	21.13
OTC	Borland	(L)	BORL	10.50	8.38	-2.13	-20.24	-	0.00	0.00	16.00	8.13
OTC	Informix	(H)	IFMX	27.25	26.94	-0.31	-1.15	30	0.00	0.00	29.88	14.25
OTC	Lotus		LOTS	37.50	39.75	2.25	6.00	-	0.00	0.00	86.50	29.75
OTC	Microsoft	(H)	MSFT	61.63	63.38	1.75	2.84	32	0.00	0.00	65.13	39.00
OTC	Novell		NOVL	17.00	16.13	-0.88	-5.15	26	0.00	0.00	26.63	13.38
OTC	Oracle		ORCL	44.19	38.50	-5.69	-12.87	37	0.00	0.00	46.50	26.25
OTC	Software Publishing		SPCO	5.38	4.50	-0.88	-16.28	-	0.00	0.00	8.50	3.00
OTC	Symantec		SYMC	16.81	17.88	1.06	6.32	105	0.00	0.00	19.63	9.88
	HARDWARE											
OTC	Apple	(H)	AAPL	42.75	37.25	-5.50	-12.87	14	0.48	1.29	43.75	24.63
OTC	AST Research		ASTA	12.13	14.63	2.50	20.62	98	0.00	0.00	33.00	10.38
NYS	Compaq	(H)	CPQ	38.75	38.63	-0.13	-0.32	13	0.00	0.00	42.13	24.16
NYS	Digital Equipment		DEC	30.25	34.75	4.50	14.88	-	0.00	0.00	38.13	18.25
OTC	Dell	(H)	DELL	41.88	38.38	-3.50	-8.36	16	0.00	0.00	47.38	19.13
NYS	Hewlett-Packard	(H)	HWP	95.88	95.88	0.00	0.00	16	1.20	1.25	102.50	71.88
NYS	IBM	(H)	IBM	74.13	70.13	-4.00	-5.40	20	1.00	1.43	76.38	51.38
NYS	Silicon Graphics	(H)	SGI	30.25	29.63	-0.63	-2.07	29	0.00	0.00	33.13	18.75
OTC	Sun Microsystems	(H)	SUNW	32.25	34.13	1.88	5.81	15	0.00	0.00	34.50	18.25
NYS	Xerox		XRX	102.00	97.25	-4.75	-4.66	16	3.00	3.08	112.75	87.63
NYS	Tandy		TAN	43.75	46.75	3.00	6.86	18	0.60	1.28	50.75	30.75
	CPU'S											
NYS	Advanced Micro Devices		AMD	25.88	23.13	-2.75	-10.63	8	0.00	0.00	31.75	16.75
OTC	Intel		INTC	60.50	59.50	-1.00	-1.65	10	0.24	0.40	73.50	56.00
NYS	LSI Logic	(H)	LSI	39.38	41.63	2.25	5.71	25	0.00	0.00	45.38	14.25
NYS	Motorola	(H)	MOT	56.38	56.25	-0.13	-0.22	24	0.40	0.71	61.13	42.13
	COMMUNICATIONS											
NYS	AT&T	(L)	T	53.13	51.63	-1.50	-2.82	17	1.32	2.56	57.13	47.25
NYS	BellSouth Corp.	(L)	BLS	51.38	53.88	2.50	4.87	20	2.76	5.12	63.50	50.50
OTC	MCI	(L)	MCIC	22.50	18.25	-4.25	-18.89	14	0.10	0.55	29.00	18.25
NYS	Northern Telecom		NT	35.50	32.75	-2.75	-7.75	29	0.36	1.10	37.75	26.00
NYS	Pacific Telesis		PAC	31.25	29.13	-2.13	-6.80	26	2.18	7.48	33.75	28.25

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NEW LOWS..................	4

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LARGEST PERCENTAGE LOSER............	Borland..............................		-20.24 %

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MICROTIMES STOCK INDEX	5478.47	5370.37	-108.09	-1.97
DOW JONES INDUSTRIAL AVERAGE	3875.15	3807.19	-67.96	-1.75
STANDARD & POOR'S 500 INDEX	465.85	458.80	-7.05	-1.51
N.Y.S.E. COMPOSITE	255.57	250.54	-5.03	-1.97
NASDAQ COMPOSITE	767.47	729.07	-38.40	-5.00

CLOSING QUOTES FOR GRAPH:

DATE	MICRO TIMES	DOW JONES
04/29/94	4639.86	3668.31
05/27/94	4709.29	3757.14
06/24/94	4238.94	3636.94
07/22/94	4577.29	3735.04
08/19/94	5070.19	3755.11
09/16/94	5323.66	3933.35
10/27/94	5478.47	3875.15
12/16/94	5370.37	3807.19

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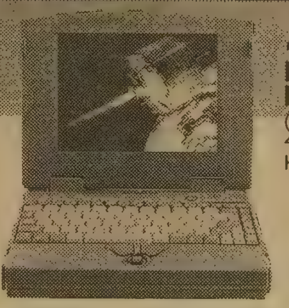

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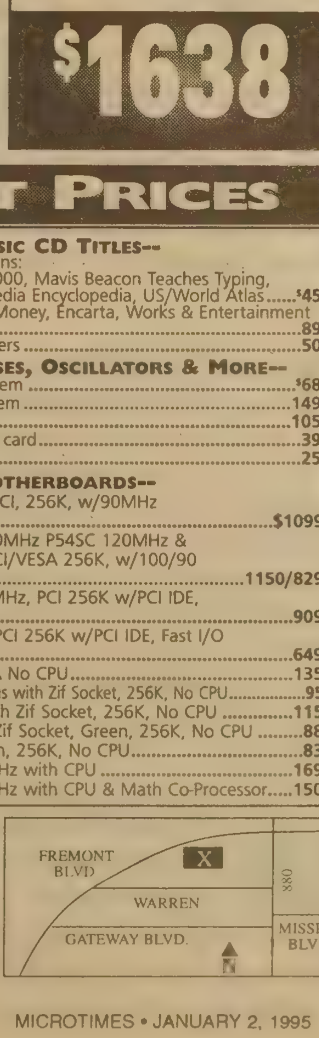

REALIZABLE FANTASIES • BY JIM WARREN

Citizen Action Can Control Nation's Wiretap System

The last column (Issue #129)—ever-so-diplomatically captioned, "The Death of Freedom and Privacy in America"—was written only days after Congress mandated that a national wiretap system be created, and allocated half a *billion* dollars to pay for its implementation within four years.

The law, H.R. 4922, was introduced August 9; fast-tracked through Congress in less than two months by suspending the rules and after only one or two trivial committee hearings; passed by unrecorded voice vote in the House on October 5, and unanimous consent in the Senate on October 7—literally minutes before they adjourned their second 1994 legislative session; and, ever-so-quietly signed into law by President Clinton on October 22.

All of it was done with almost no mention in the public press—much less any national discussion of its Orwellian ramifications.

The Law, Verbatim

To review: The law states that it is "to make clear a telecommunications carrier's *duty* to cooperate in the interception of communications for law enforcement purposes, *and for other purposes.*"

It requires that "a telecommunications carrier shall ensure that its equipment, facilities, or services that provide a customer or subscriber with the ability to originate, terminate, or direct communications are capable of—

"(1) expeditiously isolating and enabling the government, pursuant to a court order *or other lawful authorization*, to intercept, to the exclusion of any other communications, *all* wire *and electronic communications* carried by the carrier within a service area to or from equipment, facilities, or services of a subscriber of such carrier concurrently with their transmission to or from the subscriber's equipment, facility, or service, or at such later time as may be acceptable to the government;

"(2) expeditiously isolating and enabling the government, pursuant to a court order or other lawful authorization, to access call-identifying information that is reasonably available to the carrier—

"(A) *before, during, or immediately after the transmission* of a wire or electronic communication (or at such later time as may be acceptable to the government); and

"(B) in a manner that allows it to be associated with the communication to which it pertains ...;

"(3) *delivering intercepted communications and call-identifying information to the government*, pursuant to a court order or other lawful authorization, *in a format such that they may be transmitted* by means of equipment, facilities, or services procured by the government *to a location other than the premises of the carrier*; and

(4) facilitating authorized communications interceptions and access to call-identifying information *unobtrusively* and with a minimum of interference with any subscriber's telecommunications service and *in a manner that protects...information regarding the government's interception* of communications and access to call-identifying information."

(Italicized emphasis added.)

The full text of the bill, plus extensive other information, is available online from the Electronic Frontier Foundation (ask *eff@eff.org*), and you might be able to get a copy from your elected Congress-critter—if you are properly subservient in pleading for a copy.

Wiretap Anyone From Anywhere

The idea is that the telcos' digital switches will be reprogrammed so they can undetectably route "copies" of all calls of targeted calling or called-parties to any specified government listening station around the nation.

The system can be used by every local, state, and national government employee operative; bureaucrat; political appointee; and elected politician who can obtain legal or illicit access to it and is willing to use it—only as authorized, or for personal or polit-

Half a billion dollars—plus probable phone-rate increases (repeatedly referenced in the bill)—so government snoops won't have to go to a telco office to do their eavesdropping.

NOVEMBER 1994

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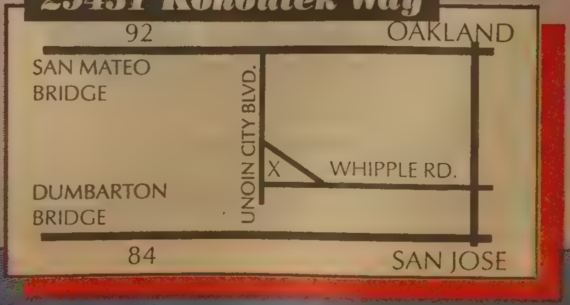

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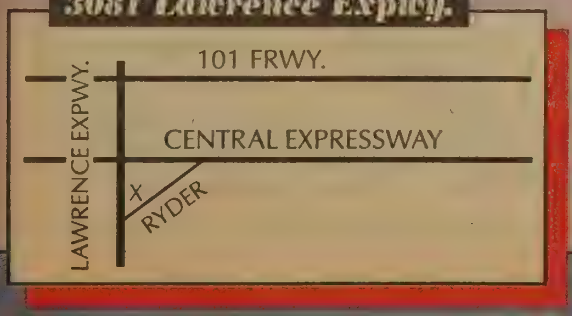

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ical gain if they dare.

Half a billion dollars—plus probable phone-rate increases (repeatedly referenced in the bill)—so government snoops won't have to go to a telco office to do their eavesdropping. Note: Reportedly, there were less than one thousand *authorized* wiretaps in 1993, of which FBI Director Louis Freeh has variously stated that eighty to less than two hundred used the digital-telephony technology that was the original official excuse for this massive system.

The Democratic administration that so eagerly sought the bill must have a new motto for the nation: "Land of the Freeh; home of the bray."

It Really Is As Bad As It Sounds

Just think of how this system might have been used by Richard Nixon (Watergate), Lyndon Johnson (who used the IRS to attack his political opponents), or unremovable FBI Director-for-life J. Edgar Hoover— who compiled the tens of thousands of surveillance reports on the nation's law-abiding political leaders and opinion makers that still remain, even after his staff destroyed thirty-five file cabinets of suddenly unneeded dossiers upon his death.

Or by Soviet spy Aldridge Ames (high CIA official for years), national-security officials Ollie North and John Poindexter, the thirteen hundred IRS employees that the Service recently reported investigating for abusing their access to confidential files, or the tiny-but-dangerous fraction of police officers who are disciplined or prosecuted annually for abusing their positions.

Think of how eagerly this probably imperfect public wiretap facility must be awaited by foreign spies, industrial spies, and the computer hackers and phone phreaks who have cracked almost every public telecom system in the nation—if we are to believe all those high-profile law-enforcement horror stories about crackers and phreaking that air on Geraldo and sweeps-week news shows.

Puny Protection Against Abuses

This law says, "A telecommunications carrier shall ensure [but without penalty for failure] that any interception of communications or access to call-identifying information effected within its switching premises can be activated only in accordance with a court order or other lawful authorization and *with the affirmative intervention of an individual officer or employee of the carrier* acting in accordance with regulations prescribed by the Commission."

That's it. That's the entire section entitled, "Systems Security and Integrity."

Could operatives under Nixon, Johnson, Hoover, North, Poindexter, IRS officials, or CIA administrators probably falsify authorizations, bribe or blackmail some telco employee in the nation, or just have one

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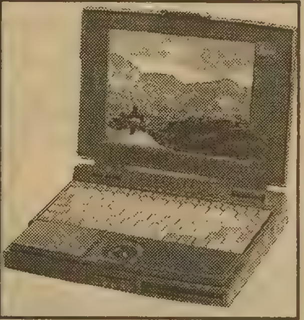

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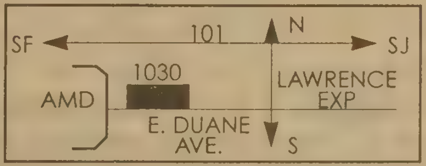

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who's a friend—who would take the "affirmative" action to enable a wiretap? That is, if they couldn't figure out how to hack the system like so many teenagers have done?

But Wiretaps Are Needed

Some wiretaps *are* needed for legitimate law enforcement and national security uses—even if the FBI did ignore its wiretap warnings of the World Trade Center bombing.

They could do what they have done—climb a pole or go to a switching center and clip on. And ISDN handsets capable of decoding digitized conversations are available for a few hundred dollars.

But the law's passed, and the half-billion's allocated, "to remain available until expended." (That's also a requirement in the law.)

No Balance Of Power

The problem is that there's no independent oversight of the uses of this snoop system. It is Executive branch agencies that will have access to it, and those same agencies—under the control of political appointees or elected politicians—will have to police themselves.

> **The law states that it is "to make clear a telecommunications carrier's duty to cooperate in the interception of communications for law enforcement purposes, and for other purposes."**

In the few weeks that this bill was being considered, there were repeated recommendations that it include mandates for Legislative- and/or Judicial-branch oversight. They were systematically ignored, except for some cost and capacity reports.

States Can Protect Their Citizens

Usually, the public and the states are helpless to correct stupid and/or arrogant actions by federal officials. However, this is different:

The states have a long-established authority to control telecommunications operations within their borders—by state legislation and by state Public Utilities Commission regulation. Thus, state legislators or state PUC commissioners can mandate the *low-cost, easily implemented safeguards* against abuse that Congress refused to require.

What technology has endangered, technology can defend—cheaply, easily:

1. **Monitor the monitors.** By state law or PUC regulation, require all telecom carriers within their jurisdiction that implement H.R. 4922 to include automated recording and reporting of all of its uses—just like the telcos now record the dates, times, calling numbers and called numbers for long-distance calls, listing them in monthly phone bills.

2. **Restore balance of power.** Require that the carriers forward monthly reports of all such wiretaps—just like phone bills—to

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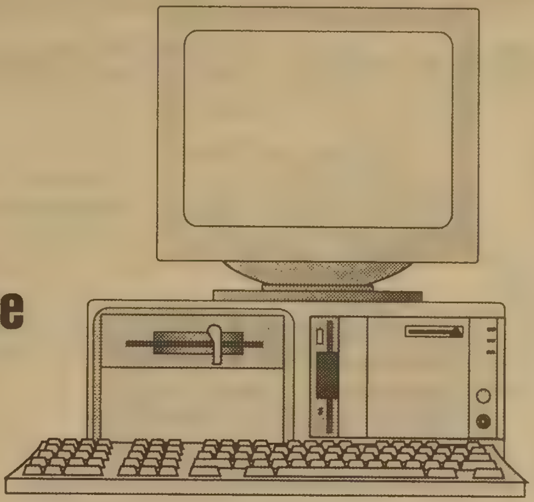

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appropriate state *legislative* and *judicial* oversight agents, and mandate that those agents timely verify the authorizations for all wiretaps thus reported. Logical oversight agents might be the chair of the state legislatures' judiciary committees and the chief justices of the state district appellate courts where each calling number and called number is located.

3. Assure an informed citizenry. Require that the carriers retain those records—for, say, two or perhaps five years—after which they are to print a copy and forward it to the subscriber of each calling- and called-number. This is an automated variation on the citizens' right to know reflected in the Freedom-of-Information Act.

We say we are a free society; let's walk it like we talk it.

4. Restraining orders. Of course, court orders could stay carriers' automated distribution of such reports to oversight agents or to the subjects of government peeps—e.g., if legislators or jurists, themselves, were the subjects of *authorized* surveillance. But even then, the court would be performing the oversight function that is *crucial* if abuse of this draconian system is to be minimized.

Prompt Citizen Action Essential

Although local and state politicians are among those who are most threatened by the potential for powerful insiders to abuse this national wiretap system, they are unlikely to redress the missing balance of power unless citizens and the press help stiffen their backbones:

1. Copy this, and perhaps a hand-scribbled note, to all of your neighbors, friends, business associates, and workplace bulletin boards.
2. Copy this—along with a one-page personal letter summarizing your concerns—to your local talk-radio hosts.
3. Send the same thing to the producers and anchors of your favorite local and network news shows, and to the producers of the national television magazine shows you watch.
4. Send the same to the editorial-page editors, government beat reporters, and high-tech reporters (if any) of your favorite newspapers and news magazines.
5. Send the same thing to your local and state elected representatives—city council members, county supervisors, state legislators, and state constitutional officers (governor, attorney general,secretary of state, treasurer, etc.)—and request a *specific* comment from them stating what they will do. Tell them you will distribute their response—or lack of response—as widely as possible among your neighbors, friends, business associates, and online.
6. Send still other copies to each commissioner of the Public Utilities Commission.

Ballot measure. In all of these communications, point out that we Californians have the ballot initiative as an option to legislative inaction. (I have begun researching that option, and formulating how to use the computer nets to coordinate and facilitate an initiative drive. More details when I have 'em.)

Nothing's changed: **Vigilance—and personal action—is *still* the price of freedom.** ■

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486DX2-66/128K VLB	972
486DX2-66/256K PCI	1,102
Pentium P5-60/256K VLB/PCI	1,492
Pentium P5-66/256K VLB/PCI	1,622
Pentium P5-90/256K VLB/PCI	1,762

SYSTEM CONFIGURATION

- Motherboard w/ CPU
- 4 MB RAM 70NS
- 200MB HDD
- 1.2MB and 1.44 Floppy Drive
- IDE 2HD/2FD Controller w/ 2S/1P/1G
- 512KB SVGA Card
- 14" SVGA .28 Color Monitor
- 101-Key Enhanced Keyboard
- Enhanced Case w/ Power Supply
- Logitech Compatible Mouse w/ Pad

UPGRADES

•340MB Hard Drive	Add $40
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•540MB Hard Drive	Add $90
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•15" Non-Interlaced Monitor	Add $90
•VLB IDE Controller	Add $15
•PCI Bus VGA Card w/ 1MB	Add $90
•16-Bit SVGA Card w/ 1MB	Add $20
•Cirrus Logic/Trident VLB w/ 1MB	Add $30
•Window Accelerator w/ 1MB	Add $20
•Orchid Fahrenheit 1280	Add $90
•Diamond S.S. Pro VLB w/ 1MB	Add $60
•250MB Tape Back-up	Add $130
•16-Bit Ethernet Card	Add $32
•Deluxe Speakers	Add $6
•Mitsumi CD-ROM w/ Card	Add $80
•Double Speed CD-ROM w/ Card	Add $130
•Sound Blaster Pro Deluxe	Add $80

Maxtor

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345MB	7345A	14ms	3.5"x1"	$179
540MB	7546	12ms	3.5"	$249

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IDE HARD DRIVES

340MB	IDE	13ms	3.5"X1"	$179
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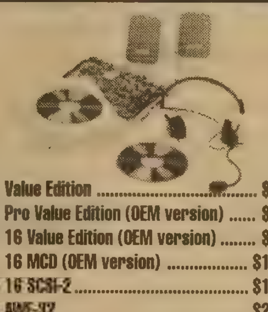
Medium Tower Case w/230W Power Supply	$61
Full Tower Case w/250W Power Supply	$76
UPS 400VA/600VA/900VA	$170/250/360

CD-ROM / MULTIMEDIA



Creative Labs	
Sound Blaster Value Edition	$52
Sound Blaster Pro Value Edition (OEM version)	$72
Sound Blaster 16 Value Edition (OEM version)	$92
Sound Blaster 16 MCD (OEM version)	$125
Sound Blaster 16 SCSI-2	$149
Sound Blaster AWE-32	$268
Discovery CD 16 Upgrade Kit	$289
Edutainment CD 16 Upgarde Kit	$374
GameBlaster CD 16 Upgade Kit	$365
WaveBlaster	$169
MediaVision	
Pro Audio Spectrum 16	$75
Pro Audio Studio 16	$123
Premium Sound 3D	$149
NEC CDR 510 Triple Speed SCSI Internal	$277
NEC 3xi (CDR 500) Triple Speed SCSI Internal	$430
Panasonic CD-562 (Double Speed) w/Card	$136
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Teac CD-50 (SCSI-2) Internal	$185
Plextor (Texel) DM3028 (SCSI) Internal	$298
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15-Bit Audio Card	$70

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Panasonic 2123	$199
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Deskjet 500 / 500c / 550c	$295 / 395 / 499
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Colorado Tape Backup 120MB	$94
Colorado Tape Backup 250MB	$154
Archive 250MB Tape Backup	$160

NETWORK CARD / SOFTWARE

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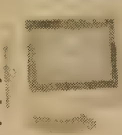
3C509-16 Etherlink III 16-Bit Coax/TP	$118 / 118
COMPULAN	
NE 600E 16-Bit TP	$75
NE 200E 16-Bit Coax	$65
NOVELL CARDS	
NE2000 16-Bit Coax	$130
NE2000 16-Bit TP	$135
NOVELL SOFTWARE	
Netware 3.12 for 5 / 10 / 20 Users	$595 / 1,290 / 1,895
Netware 4.01 for 5 / 10 / 20 Users	$820 / 1,820 / 2,630

MONITORS



14" SVGA 1024x768 .39	$174
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Mag DX17F 17" 0.26DP	$641
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Nanao F550iw	$917
Nanao F560iw	$1150

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Matrox	
MGA PCI 2+	$395
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#9GXE 64 2MB DRAM VLB/PCI	$250
#9GXE 64 Pro 2MB VRAM VLB/PCI	$335
#9GXE 64 Pro 4MB VRAM VLB/PCI	$515
ATI	
Wonder 1MB ISA	$105
Ultra Plus 2MB DRAM PCI/VLB/ISA	$161
Ultra Pro 2MB VRAM PCI/VLB/ISA	$220
Ultra Pro 2MB VRAM-EISA	$274
Ultra Pro Turbo 2MB VRAM PCI	$257
Diamond	
SpeedStar Pro 1MB VLB/ISA	$93
Stealth 32 2MB PCI	$167
SpeedStar 64 PCI/ISA 1MB	$118
Stealth 64 2MB VRAM PCI/VLB	$272
Viper 2MB VLB/PCI	$295
Viper SE 2MB PCI	$259
Orchid	
Kelvin VLB/PCI (64-Bit) 1MB/2MB	$126/176
Genoa 8500 VLB 1MB	$85

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Zoltrix 14.4K V.32bis, V.42bis I/E	$85/138
US Robotics Sportster 14.4K I/E	$102/122
US Robotics Courier Series	$Call
14.4 Fax/Modem	$64
Hayes Optima 28.8 V. Ext	$435
USR Sportster 28.8 Int/Ext	$195/210

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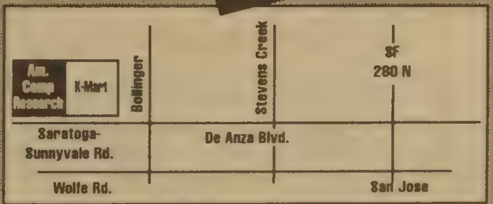

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Letters

What Intel Should Do. One Person's Opinion

Your magazine is probably being read by many potential Pentium buyers. It is thus important that you publish a balanced report on the Intel Pentium bug.

Intel is trying to downplay the Pentium FDIV bug for obvious reasons. Recalling two million CPUs costs money. Intel's official statements about the rareness of the bug are misleading: One in nine billion cases is not so rare on a fast machine. In fact, some postings on Usenet prove the error to occur twice an hour when doing repeated random divisions on a 90MHz Pentium machine.

Moreover, with Intel doing anything it can to avoid replacing CPUs, and with the dismal failure of the media to publish anything but Intel official statements, there are some facts that should be brought up.

1) The Pentium fails to work according to specifications (the IEEE floating-point standard).

2) Intel knowingly concealed this fact from millions of unsuspecting customers after it found out about it, in June 1994. These customers include many relying on their floating-point calculations to be correct. That's scandalous.

3) The bug is not as rare and insignificant as Intel officials would like the media to believe. There have been hundreds of reports on the Internet proving that the problem can manifest in very simple divisions, including, but not limited to, loan payments bearing interest rates. In fact, every floating point calculation that involves a division is suspect of incorrectness.

4) Customers who bought a buggy Pentium have already lost money: the resale value of their expensive machines has already dropped as a result of the publicity about the bug.

5) Anyone with a buggy Pentium CPU can never be certain that the bug will not strike sometime during the usage of the machine. It may also have happened in the past and gone unnoticed, not because the error was small, but simply because users tend to believe what their computer is telling them.

There's only one fair resolution. Intel should replace the CPUs of all those buyers who request it. This will be a great boon to Intel's credibility.

Ariel Faigon
via Internet

For in-depth analysis of this complex matter, see Paul Hoffman's discussion of the Pentium bug in Industry Insight this issue. For Pentium jokes, see Dvorak's column.

Interestingly enough, at the recent PC Outlook conference, several hardware vendors reported that orders for Pentium-based systems were actually up since news of the bug emerged in the press. This fact did not keep Intel's competitors from enjoying themselves at the standard-bearer's expense...

—eds.

Plug 'N' Play Revisited

The letter in our November issue in which reader D. Bennett took exception to claims about the "plug and play" nature of the Macintosh environment seems to have struck a nerve....

Mr. Bennett, I am afraid you have not the foggiest idea what real plug and play means. I assure you that until very recently the world of the "PC" has not had real plug and play. It can be a real nightmare to plug in a set of boards consisting of sound, SCSI, IDE, Ethernet, serial, parallel, and SVGA into a single PC. The number of jumpers, IRQs, DMAs, addresses, and other bothersome stuff which has to be considered when configuring the system is quite daunting.

You are, however, correct in noting that the Mac certainly was late getting into the plug and play game. This feature existed on certain HP calculators, computers, and printers long before it existed on any sort of personal computer on the mass market.

So far as I know, the first application of true plug and play to a mass market personal computer was the Commodore Amiga in 1985. I have a system which has had two SCSI controllers, serial, parallel, sound, extra memory, processor accelerator, Ethernet, and an extra pair of serial ports all installed at once. The only thing I ever had to configure on any of these cards was the SCSI controller ID (because I was developing software for that card), the Ethernet AUI/thinnet jumpers, and the memory card's memory size selectors.

Everything else was handled for me by the computer as part of its "autoconfiguration" sequence. This sequence goes out and sniffs the cards during the boot cycle. The cards declare what they need in the way of computer resources. Insofar as these resources exist, the card is informed of its allocations and allowed to run its initialization software. The only time this sequence gave any "trouble" was when I tried to run memory cards giving me more memory than the address space of the CPU chip allowed. "IRQ," "IO Address," "DMA," and other typical PC conflicts simply do not exist on the Amigas.

One has to ask why Commodore's Amiga has been overlooked in all the industry hype. One of course must ask why this feature is considered so revolutionary and new when it had appeared on some smaller market machinery well before it appeared on the Amiga.

Perhaps it is time for you and the industry as a whole to take off the blinders and take a very good look around. There are a lot of very good ideas that do not exist yet on the PC or Mac machinery.

Joanne Dow
jdow@bix.com
Amiga Exchange Editor, BIX

D. Bennett doesn't really understand what "plug and play" means. The term "plug and play" means to plug it into the wall (120 AC), turn it on, and it works.

The Mac did it extremely well. My wife (not very computer literate) wrote her thesis on a Mac back ten years ago when it took a computer scientist to run the PC versions of CP/M and DOS.

Kerry Belanger
via Internet

Death Of Freedom And Privacy: Highly Exaggerated?

I for one should be grateful for Jim Warren's success in making state statutes available online. But why is it I wonder that all the idiots and "bastards" are elected representatives of the people in Congress; while all the intelligent and patriotic are on The WELL? And why is it that I find it more difficult to hear the little bit of message when people scream and rave at the top of their decibels?

It occurred to me that if I changed the title of the article of Warren's recent column to fit the message I got, it would read "The Death of Freedom and Secrecy in America."

Basically, isn't the gist of the piece "freedom of secrecy"? So that (getting away a bit from the sacrosanct individual) there can exist and flourish groups or SIGs with their secret or "private" pool of communications?

Isn't freedom about being open to all; you know, something like the sunshine laws? Why, if all stayed free and open, all this terrifying legislation would not be needed; and we could sure use all that money elsewhere.

I have my own kind of paranoia; it fires up when I think that Dialog, one of the largest depositories of information, is now owned by the British; and so is Mead/Lexis which also adds a comprehensive compilation of most of our laws. Some people may trust the British; but what if they in turn sell those resources to the Japanese; and they in turn to an East-block consortium?

Have we failed to see that information is becoming the currency of power and survival in this world, and that it must be monitored and protected like any national resource? Or have we, like Oppenheimer before us, reached the conclusion that we preserve freedom by sharing any piece of information even with those that claim to be our enemies? Let's have some balance.

Antonio M. Fiorentino
San Francisco, CA

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○ MACINTOSH NOTEBOOK

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Step 1: Enter NoteBook Brand Name & Model #, If Preference

○ Upgrades or Peripherals I Am Not Buying A System. I Want A Quote On My Selection(s) Of Upgrades Or Peripherals

My Budget For System Is ○ Under $1000 ○ $1000 to $1999 ○ $2000 to $2999 ○ $3000 to $3999 ○ $4000 to $4999 ○ Over $5000

STEP TWO: CONFIGURATION REQUESTS:

CPU ○ PENTIUM ○ 486 ○ 386 ○ Mac Quadra/Performa ○ MacPower PC

CPU MHz SPEED:
○ DX4 ○ DX2 ○ DX ○ SX ○ SLC ○ Quadra ○ PowerPC
○ 100 ○ 90 ○ 80 ○ 75 ○ 66 ○ 60 ○ 50 ○ 40 ○ 33 ○ 25

BUS TYPE ○ PCI ○ VLB ○ EISA ○ ISA

CACHE ○ 64K ○ 128K ○ 256K ○ 512K

RAM: ○ 1MB ○ 2MB ○ 4MB ○ 8MB ○ 16MB ○ 32MB ○ 64MB ○ 128MB

HARD DISK DRIVE: ○ 100MB+ ○ 300MB+ ○ 500MB+ ○ 1GB+ ○ 4GB+
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MONITOR: ○ SVGA ○ VGA ○ MONO ○ 26 DPI
○ 14" ○ 15" ○ 17" ○ Non Interlace ○ 28 DPI
○ 20" ○ 21" ○ Multisync

FLOPPY DRIVE: ○ 1.44MB and/or ○ 1.2MB

FAX MODEM: ○ Internal ○ External ○ 9600bps ○ 14400bps ○ 28800bps

CASE TYPE: ○ Mid Tower ○ Desktop ○ Full Tower

VIDEO CARD RAM ○ 512KB ○ 1MB ○ 2MB ○ 3MB ○ 4MB

POINTING INPUT DEVICES: ○ Any Mouse ○ MS Mouse ○ Keyboard
○ Serial ○ Bus ○ PS2 ○ Trackball ○ Joystick ○ Ball Point ○ Pen

OPERATING SOFTWARES NEEDED: ○ DOS ○ OS2 ○ Mac ○ UNIX ○ MS Windows

STEP THREE: MULTIMEDIA UPGRADE ○ Please Add To Step 1 & 2 Quotation ○ Please Quote Me Separately

CD ROM DRIVE: ○ Internal ○ IDE ○ SCSI ○ External

CD ROM TITLES INCLUDED: ○ 1-5 ○ 5-10 ○ 11+

SPEED ○ 2X ○ 3X ○ 4X

○ BRAND NAME ○ No Brand Name Preference

CD ROM Brand Name and Model Number

SOUND CARD ○ 16Bit ○ 32Bit ○ 64Bit

SPEAKERS ○ Less Than 25W ○ 25 to 50W ○ 50 to 75W ○ More Than 75W

STEP FOUR: NOTEBOOK SECTION (Please Note You Must Make Choices In Steps 1 & 2 To Complete Step Four.)

SCREEN TYPE: ○ Mono ○ Dual Scan Color ○ Active Color

PCMCIA SLOT: ○ Type I ○ Type II ○ Type III ○ Type IV

○ Audio Capable ○ Docking Station ○ Extra Battery ○ Fax Modem

STEP FIVE: NETWORKING NEEDS: ○ Please Contact Me on My Networking Needs Indicated Below

○ Software ○ Hardware ○ Consultation ○ Design ○ Installation ○ Administration
○ Users 2 to 10 ○ Users 10 to 50 ○ Users Over 50 ○ Novell ○ Lantastic ○ MS NT ○ Apple Talk ○ MS Workgroups

STEP SIX: UPGRADES and PERIPHERALS.

○ Include Step Six Choices To The Above Quotation

○ Ink Jet Printer ○ Laser Printer ○ Accelerator
○ Color Printer ○ Hand Scanner ○ Tape Backup
○ Dot Matrix Printer ○ Flat Bed Scanner ○ Digitizer

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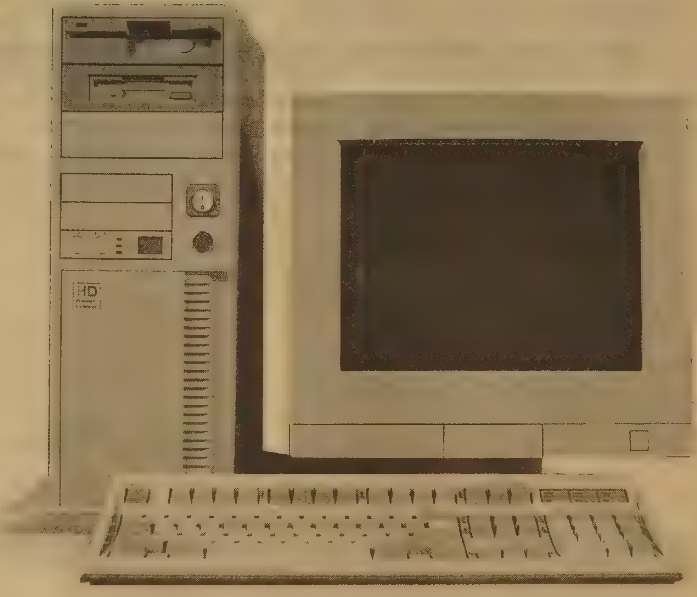

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- *Microsoft Windows 3.11*
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- *PCI Enhanced IDE Controller*
- *2-16550 High Speed Serial Ports*
- *1 Parallel Port*
- *Diamond Stealth 64 PCI Video Card w/2MB DRAM*
- *Sound Blaster 16 Stereo Sound Card*
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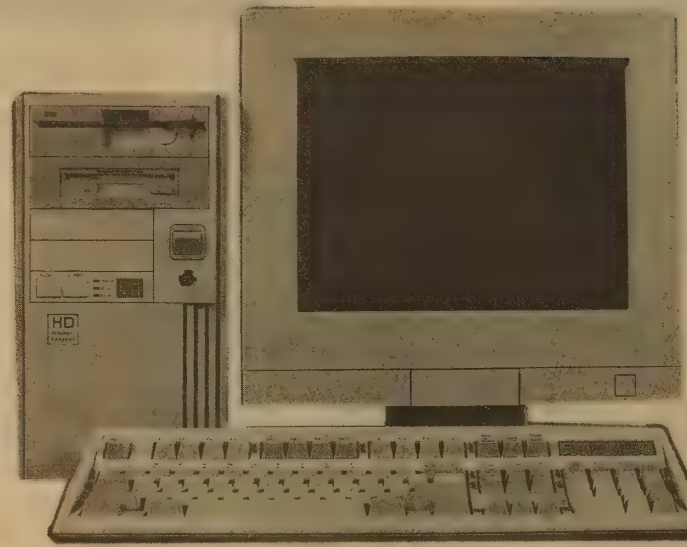

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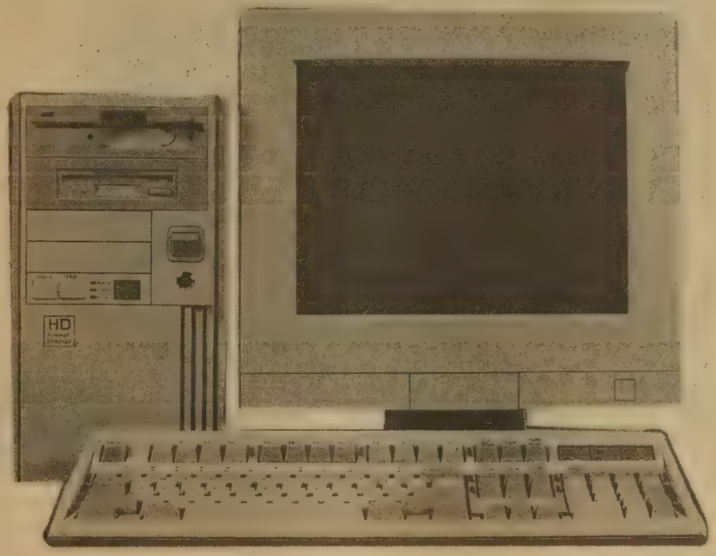

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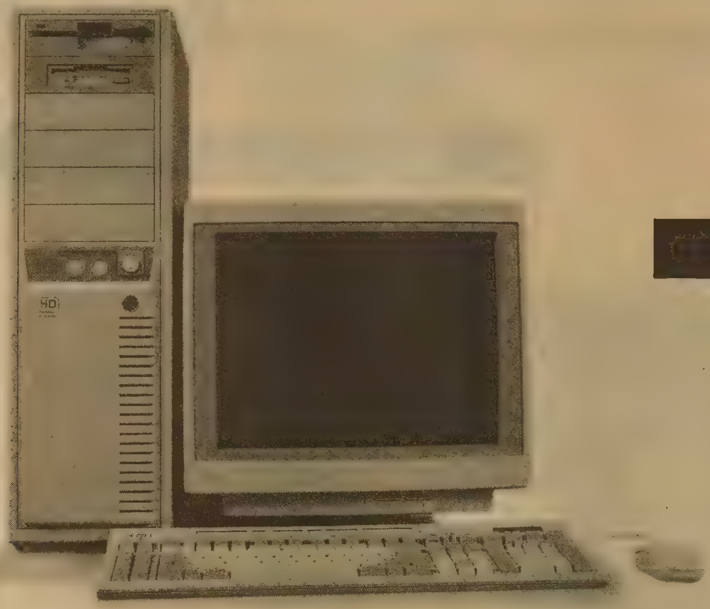

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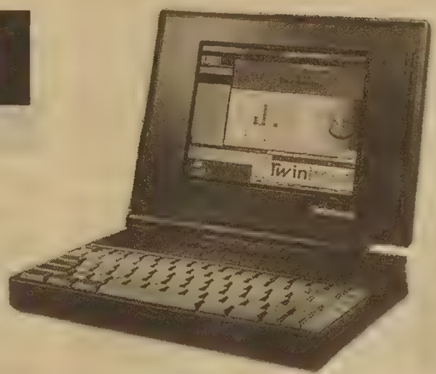

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LapLink For Windows

Traveling Software Began Offering Products To Assist Portable Computer Users Long Before The Introduction Of The First IBM Compatible Portables.

RESOURCES:

LapLink for Windows, $199.95
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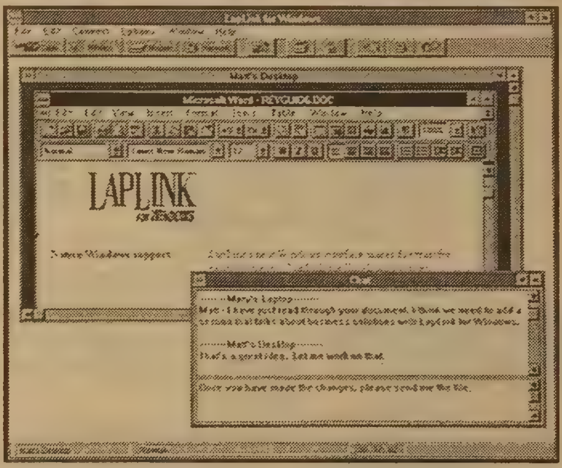
The business of connecting a portable to a desktop or another portable is essential if you use a portable on the go. In the early days, people would make copies of files on diskettes and then copy the files back and forth between computers. This quickly became cumbersome as the size and number of files we carry around grew. Products were soon developed that helped synchronize the files on our computers and keep everything with the most up-to-date version.

One of the first companies to get into this software niche was Traveling Software, which began offering products to assist portable computer users long before the introduction of the first IBM compatible portables. Traveling Software has consistently improved its products, centering around this basic need of hooking computers together.

LapLink, from Traveling Software, has consistently been my favorite product for linking computers together. When it was first introduced, you connected the computers via a serial cable. This process was made faster by the ability to connect through the parallel ports. Next, the ability to link the computers together through modems was added. On and on it went, with each new version being more powerful. Today, LapLink for Windows is the most powerful and versatile connection product yet.

This newest release in the LapLink family allows you to do all of your work through Windows. There are advantages to this interface—you can work with a mouse and icons to move files back and forth between computers and copy individual files by doing little more than drag-and-drop a file from one computer's directory to the other computer's directory. But there is lots more to this product than a change of interface.

One of the most powerful additions is the ability to access a computer and control it from a remote location. Other products provide remote access, but combining this feature with a file transfer program offers a clear advantage. Not only can you transfer files between distant computers, but you can also run the remote computer as if you were there. This is especially useful for keeping up with email that may have piled up at the office or for selectively tapping into database files that are routinely updated.



One of the features I especially like is the ability to connect into a computer that only runs DOS. Through a setup procedure that takes a little patience to accomplish, you can set up a DOS computer to accept calls from your Windows portable and give you full access. This is useful for technicians who need to work on a distant computer.

Another feature is the ability to communicate with several computers in one session in order to coordinate all of them. While this requires a modem for each computer you are remotely connecting with, it means you can use LapLink in networks to simultaneously install software or data files on multiple computers.

For users working with large database files, lots of time can be saved with LapLink's SpeedSync feature that will transfer only that portion of a database file that is new or changed. So, rather than taking the time to transfer a huge database file, the program will simply update the file on your computer with the missing data. Traveling Software estimates this can give you up to an 800% increase in transfer speeds.

In order to use this software from a remote location, the host computer must be turned on with LapLink for Windows running. When you dial in from a distant location, the host will answer. You can then choose to transfer files between the two machines, run the remote machine from your distant location, or chat with the host operator if there is one. You can type messages back and forth and move freely between the file transfer, remote control, and chat modes. In short, this program brings together a variety of features.

There are, of course, security measures including passwords to prevent unauthorized access to the machine. You can also reset the host computer after you have completed a session. Additionally, you can set up your host machine so that the screen blanks when you access information. This will prevent anyone from watching the information come across the screen as you

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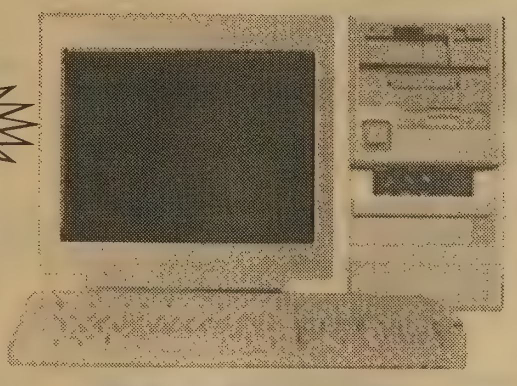

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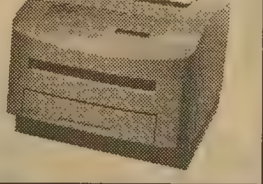

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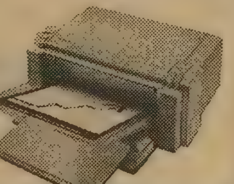

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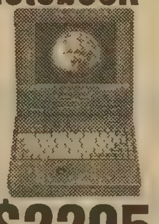

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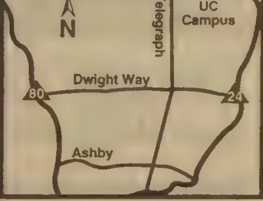

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> Other products provide remote access, but combining this feature with a file transfer program offers a clear advantage.

operate the host computer from afar.

A full log is maintained, recording who accessed your desktop computer and which files were transferred. In case the computer you want to connect with lacks the software, it can be transferred via serial cable or over a modem. And finally, if you decide you don't want the software on your system there is an uninstall icon that will remove all of the relevant files. In the days before Windows it was easy to remove unwanted software, but with Windows, files are scattered all over the place.

Traveling Software has included an automatic modem installation module so you will not have to figure out the details of modem connection. After you have installed the software, you can test your modem by registering the product electronically. It is a terrific product. Technical support is available by phone, although there is extensive and detailed documentation and help screens included in the software.

This is the most sophisticated, yet easiest to use of the long line of LapLink products. It is hard to imagine all of this power for $199.95. If you work away from your primary machine, this may be just what you are looking for. It's great to have all of this power in a single package. Upgrades from earlier versions are available for a fraction of the cost.

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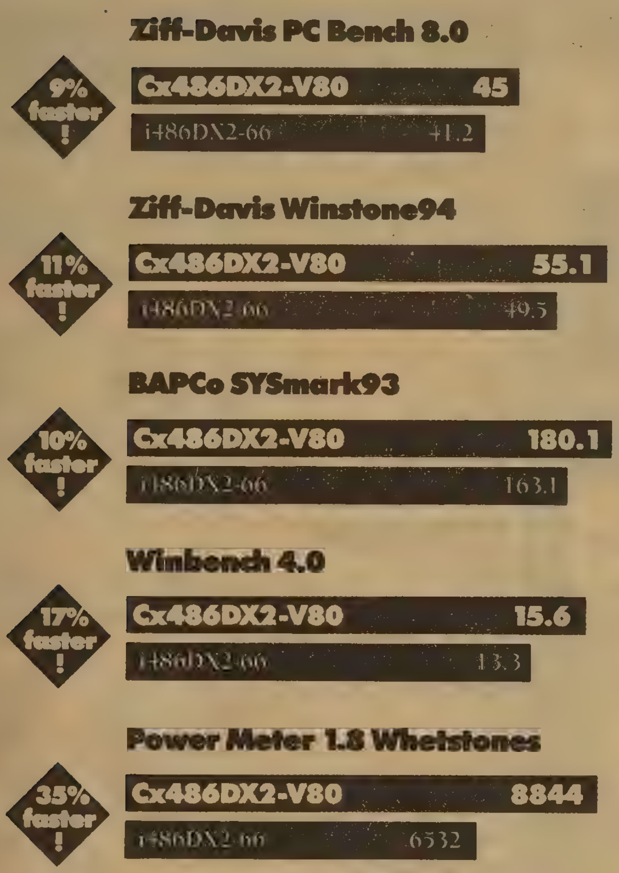

Benchmark	Cyrix DX2-V80	Intel DX2-66
PC Bench 8.0	**45.0**	41.2
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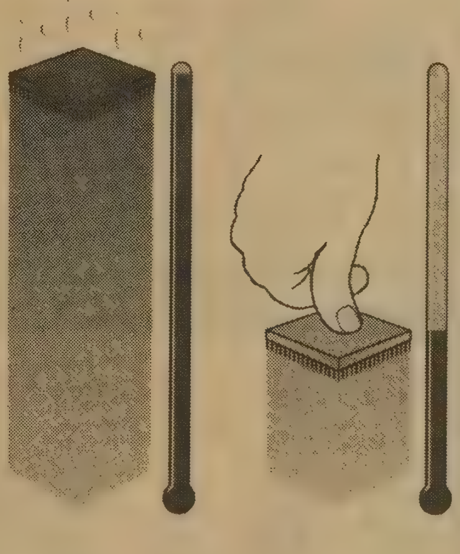
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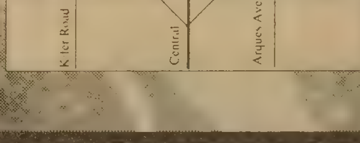

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SONY					
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33A	INT	INCL	2X	w/card&cable	$135.00
TEAC					
SuperQuad	INT	INCL	4X		$319.00
PIONEER					
DRM-604X	6Disk/Ext	SCSI	4X	612K/300MS	$955.00
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DRM-1804X	18Disk/Ext	SCSI	FAST	FAST	$1890.00

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DigitalEdge	KIT INCL 3X ASP,Speaker	$675.00
OFFICE	KIT INCL MS OFFICE	$529.00

OPTICALS/REMOVABLES

Model	TransRate	Capacity	Interface	INT/EXT
Maxoptix				
TahitiIIIM	13Mbits/Sec	1.3GB	SCSI 1/4MB	$2150.00/$2300.00
TahitiIIIM	13Mbits/Sec	1.3GB	SCSI 1/4MB	$2400.00/2500.00
1GB	Cart	Glass/Poly		$195.00
HEWLETT PACKARD				
C1716T	FAST	1.3GB	SCSI	$2395.00
C2550	FAST	1.3GB	SCSI	$2795.00
1.3GB	Cart	Optical		$129.00
FUJITSU				
M2512A	3600RPM	230MB	SCSI	$780.00
M2512A	3600RPM	230MB	SCSI	$945.00
SyQuest				
SQ5110C	88MB	SCSI	51/4	$240.00/$455.00
SQ3105S	105MB	SCSI	31/2	$252.00/$405.00
SQ3105A	105MB	IDE	31/2	$192.00
SQ200C	200MB	SCSI	51/4	$380.00/$599.00
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adaptec		Price
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AHA-1522A	7HD/2FD 16 bit kit	$139.00
AHA-1542CF	SCSI Master Kit	$238.00
AHA-1542C+	SCSI Masterw/ Corel SCSI	$314.00
AHA-1640	MicroChannel	$299.00
AHA-2742AT	EISA SCSI Master	$369.00
AHA-2842VL	VESA SCSI Master	$239.00
APA-460	PCMCIA Slim SCSI	$289.00
AHA-2940	PCI SCSI Master	$279.00
AHA-2940W	PCI SCSI Master WIDE	$359.00
BusLogic		
BK545S	Fast SCSI ISA kit	$209.00
BK445S	VL BUS Fast SCSI kit	$199.00
BK747S	EISA Fast SCSI kit	$369.00
BK946C	PCI Fast SCSI kit	$239.00
BK510	ISA IDE Cache Cont	$99.00
BK410	VLB IDE Cache Cont	$139.00
BK910	PCI IDE Cache Cont.	$189.00
FUTURE DOMAIN		
TMC850	8-bit w/ BIOS	$59.00
TMC1670	16-bit SCSI SVP	$149.00
TMC1680	16-bit SCSI 7HD/4FD	$140.00
SCSI2GO	PCMCIA TYPE 2	$275.00

NETWORK/FAX/MODEMS

SMC		Price
Elite Ultra Ethernet		
•16 bit	10BaseT or Coax	$109
•16 bit	Combo	$119
•32 bit	EISA Combo	$219
Stackable Hubs		
•12 port Hub		$599
• Network management Hubs		$419
Twisted Pair Hubs		
•10 BaseT w/ 12 RJ45		$599
•10 BaseT w/ 8 RJ45		$349
3Com		
3C503 Etherlink II	16bit 10BaseT/Coax	$169/174
3C509 Etherlink III	10BaseT or Coax	$119/5Pk-539
3C509 Etherlink III	16bit Combo	$119
32bit EISA Etherlink III	10BaseT or Coax	$229
3C589 PCMCIA	10BaseT of Combo	$189/239
USRobotics	Sportster 14,400 V.42/V.32	
	Int/Ext	$109/129
	Mac & Fax	$139
	Worldport	$289
	Sportster 28,800 V.42/V.32 Int/Ext	$Call

TAPE BACK-UPS

Model	TransRate	Capacity	Interface	INT/EXT
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4320NT	11MB/Min	2.0GB	SCSI	$799.00/$899.00
4324	Large Cache	4.0GB	SCSI	$899.00/$995.00
Tapestor 250	DC2120	250MB	Floppy	$125.00
Tapestor 250	DC2120	250MB	ParrPort	$279.00
Viper 1/4" Tapes				
2150S	6MB/Min	250MB	SCSI	$320.00/$422.00
2525S	6MB/Min	525MB	SCSI	$459.00/$555.00
HEWLETT PACKARD				
35470	5MB/Sec	2.0GB	SCSI	$799.00/$899.00
35480	5MB/Sec	4-8GB	SCSI	$885.00/$995.00
C1553A	FAST	4-16GB	SCSI	$1099.00/$1199.00
WangDAT				
3100DAT		2.0GB	SCSI	$849/949
3200DAT		4-8GB	SCSI	$899/999
3400DX DAT		4-8 GB	SCSI	$999/1099
WANGTEK				
5150S		250MB	SCSI	$399/499
5525S		525MB	SCSI	$539/639
COLORADO MEMORY SYSTEMS INC.				
DJ-10	DC2120	120MB	Floppy	$95.00
DJ-20	DC2120	250MB	Floppy	$135.00
DJ-30	DC2120	350MB	Floppy	$199.00
FC-10	Controller	w/ Cables		$79.00
TC-15	Controller	w/ Cables	Hi-Perf	$169.00
Parallel Port External Back-up Drive				
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Trakker250		250MB	ParrPort	$320.00
Trakker350		350MB	ParrPort	$370.00
Trakker700		700MB	ParrPort	$485.00
EXABYTE				
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2501	Internal	UNIT	ONLY	$522.00
EXB-8205	500KB/Sec	2.5GB	SCSI	$1349.00/$1599.00
EXB-8505	1MB/Sec	5.0GB	SCSI	$2079.00/$2499.00
EXB-8500	500KB/Sec	5.0GB	SCSI FH	$2299.00/$2599.00
EXB4200		2.0GB	SCSI	$849/949
EXB-4200C		5.0GB	SCSI	$949.00/$1040.00

VIDEO CARDS

Number Nine Computer Corporation	Price
9GXe L-10 ISA/1MB	$255
9GXe L-11 VLB/ISA/2MB	$349
9GXe L-12 VLB/ISA/3MB	$413
9GXe L-14 ISA/4MB	$349
9GXe 64 PCI/VLB/1MB	$179
9GXe 64 PCI/VLB/2MB	$249
9GXe 64 Pro PCI/VLB/2MB	$349
9GXe 64 Pro PCI/VLB/4MB	$499
Hercules	
HG 720 VLB/2MB	$319
HG310 ISA/1MB	$209
HG610 VLB/1MB	$249
S 501 VLB/1MB	$139
S 801 PCI/1MB	$129
D 601 VLB/1MB	$159
D 602 VLB/2MB	$219
D 702 VLB/2MB	$229
D 902 PCI/2MB	$239

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2V	1024X768	14"	$220
3V	1024X768	15"	$435
XE15	1024X768	15"	$524
XE17	1024X768	17"	$949
XE21	1024X768	21"	$1999
XP15	1024X768	15"	$689
XP17	1280X1024	17"	$1269
XP21	1600X1200	21"	$2529
NOKIA CONSUMER ELECTRONICS			
449E	1024X768	15"	$499
447L	1280X1024	17"	$789
447X	1600X1280	17"	$999
445M	1280X1024	21"	$1995
445X	1600X1280	21"	$2600
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15E	1024X768	15"	$379
15EX	1280X1024	15"	$365
15G	1024X768	15"	$389
17	1280X1024	17" .28	$880
17G	1280X1024	17"	$780
20	1600X1280	20"	$1445
21	1600X1280	21"	$1699
HITACHI			
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Elite17	1600X1200	17" .26	$980
20s	1280X1024	20"	$1190
PRO21	1600X1280	21" .28	$1999
SONY			
GPD-15sf	1280X1024	15" .25	$420
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NANAO			
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F5550i.w	1280X1024 NI	15" .28	$925
F560i.w	The GREEN MONITOR	17"	$1199
T560i	1280X1024 NI	17" .25	$1395
T660i	1280X1024	20" .31	$2095
F760i	1280x1024	21" .31	$1885
MAG			
DX15F	1280X1024 NI	15" .28	$369
DX17F	1280X1024 NI	17" .26	$669
MX15F	1280X1024 NI	15" .28	$449
MX17FG	GREEN LOW RAD NI	17"	$849
MXP17F	1280X1024 NI	17" .26	$949
MX21F	1600X1200 NI	21" .28	$1849

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STEALTH 64 DRAM VLB/PCI 2MB	$219
STEALTH 64 VRAM VLB/PCI 2MB	$319
STEALTH 64 VRAM VLB/PCI 4MB	$469
VIPERPro PCI 2MB/VRAM	$429
VIPER SE VLB/PCI 2MB	$359
VIPER SE VLB/PCI 4MB	$509
SPEEDSTAR 64 PCI/ISA 1MB/DRAM	$149
SPEEDSTAR 64 PCI/ISA 2MB /DRAM	$199
SPEEDSTAR PRO VLB/PCI 1MB/DRAM	$119
STEALTH 32 DRAM PCI/VLB 2MB/DRAM	$189
matrox	
MGA Ultima VLB 2MB 1600 x 1200	$429
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MGA IMP3V Impression VLB 3MB 1280 x 1024	$739
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Graphics Ultra Pro Turbo 64 PCI/4MB	$589
Graphics Ultra Pro Turbo 64 PCI/VLB/2MB	$379
Graphics Ultra Pro PCI/2MB	$299
Graphics Ultra Pro VLB/2MB	$299
Graphics Ultra Pro EISA/2MB	$329
Graphics Ultra Pro ISA/2MB	$279
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Computer Of The Month

NEC's new Versa S Series

NEC has long been a leader in notebook computers. They were the first company to come out with a really light unit and led the rest of the field into notebooks. Their latest entry is the S series which comes in a number of configurations ranging from a monochrome model that weighs under 4 lbs. and is less than 1.5" thick all the way up to an active matrix color model that weighs 4.66 lbs. and measures a little less than 1.75" thick. All models measure a little less than 8.5" x 11."

Each of the models come with a variety of processors that range in speed from 33MHz all the way up to 50MHz. The standard configuration is 4MB of RAM, but this can be increased up to either 8 or 12MB. All models come with a variety of hard drives as large as 350MB. In time, larger drives will also be offered.

NEC is able to pack so much into such a small package because an internal floppy drive is not part of the basic model. A separate 1.44MB floppy drive is included instead and attaches to the computer via a small cable. This setup gives the user access to diskettes while limiting the overall size of the computer. When traveling, it is easy to pack the drive away in a suitcase or simply leave it at home if you will not need to copy to or from a floppy drive on your trip.

The Versa S series is packed with powerful features. The display is a large 9.5" and offers clear resolution. If you prefer, you can attach a color monitor to the system and set it up to either use the external monitor, internal display, or both. It is easy to toggle between these modes. I tried this out with the Nanao FlexScan F340i-W and found it to work perfectly. I still like this monitor and while it is a little more expensive, it is a quality monitor with many features, including energy efficiency.

The keyboard on the Versa S has an adequate layout, but not as good as Toshiba's, which has the PgUp, PgDn, Home, and End

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NEC

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GDM-20SE 20" State of the Art	$1855

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AcerView

AcerView 34T 14" 1024x768 N-I .28dpi	$245
AcerView 56L 15" 1280x1024 Flt-Scr	$345
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Graphics Wonder 1MB DRAM	$149
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Graphics Pro PCI 2MB VRAM	$295
Graphics Ultra Pro EISA 2MB	$325
Graphics Pro TurboOEM PCI/VLB 2MB	$279
Graphics Pro TurboOEM PCI/VLB 4MB	$455

DIAMOND

Viper Pro 4MB VRAM	$call
Viper SE 2MB VRAM PCI/VLB	$375/365
Stealth 64 2MB DRAM PCI/VLB	$215
Stealth 64 2MB VRAM PCI/VLB	$335

Genoa

8500 VL Turbo 1MB VLB	$95
Phantom 32i 2MB VLB	$145
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VIDEO CARDS

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Number Nine

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9GXe 64 PCI/VLB 1MB/2MB	$175/239
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MXT-7546A 546MB IDE 12ms 256K	$240

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CFS420A 420MB IDE >12ms	$194
CFA540A 540MB IDE >12ms	$265
CFA810A 810 MB IDE >12ms	$425
CFA1080A 1.08GB IDE 9.5ms	$545

Quantum

LPS270A 270MB IDE 12ms	$185
QM30365A 365MB IDE 12ms	$195
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Mitsumi Dual Speed CD-ROM IDE BUS	$135
Toshiba XM3401B SCSI-II CD-ROM	$239
Toshiba XM3501B SCSI-II 4X Speed	$319
Teac SuperQuad 4X Speed w/ Ctrl Card	$319
Plextor Quad-Speed SCSI-II CD-ROM	$439

TAPE BACKUP DRIVES

Conner 250 w/ 1 tape cartridge	$145
Conner 250 External (via parallel port)	$309
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Colorado DJ20 JUMBO250 250MB	$159
Trakker 120 (parallel external backup)	$273
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Summit SE-120 120MB Backup	$129
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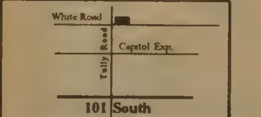

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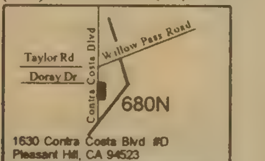

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San Jose, CA 95134
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keys located near the cursor movement arrow keys. While I can't put my finger on what is wrong (no pun intended), I can report that my typing on the Versa S is not as accurate as on others that I have examined. I suspect, however, that it is a matter of getting used to the touch and feel of the NEC.

What I do like about the keyboard is the SurePoint button which takes the place of a trackball. IBM was the first company I saw that used this feature. It is about the size of a pencil eraser and fits unobtrusively between the G, H, and B keys. You push it in the direction you want the arrow to move. The harder you push, the faster it moves. This is an excellent arrangement and you will become very comfortable with it in a short time. For those who like to work in cramped places, this is a real advantage. If you choose to use a conventional mouse, it is simple to attach it to the port on the back that will accommodate either a mouse or a PS/2 compatible keyboard.

Like many new computers, the Versa S also provides PCMCIA slots. NEC designed these slots to accept two cards, Type I or II, a combination or a single Type III card. The difference between the types is their thickness. A Type III card takes up the space of both slots, while plugging into only the lower slot. I had trouble getting my MobileMax Maxtor 131MB hard drive to work, but discovered that I simply needed to push it in farther that I had. The problem did get me to phone NEC's technical support system and learn that it works reasonably well and can be reached through an 800 number.

There are setup features that allow you to control the level of power conservation. However, with an active matrix color display, you should expect only about an hour and a half of battery life. Extra Nickel Metal Hydride battery packs are available. On the monochrome unit, battery life may be as much as two and a half hours. Not particularly long compared to other machines available.

NEC's documentation seemed a little weak to me. It told lots of things I didn't need to be told. Overall, the Versa S is wonderful and includes a three year warranty policy. For the first year, NEC gives an extra warranty that guarantees to return a broken computer within a day. NEC is a name you can trust and this new line of notebook computer is certainly worth looking at. It offers full and powerful features in a small package. ■

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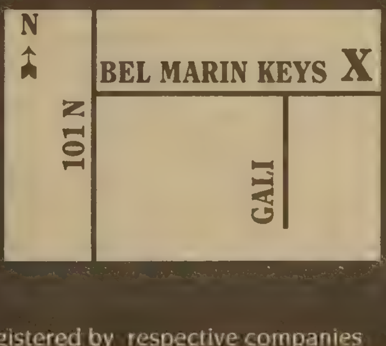

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TELECOMMUTING • BY ROBERT MOSKOWITZ

The Evolution Of Work

The Post-Industrial Revolution Is Creating Technology That Allows A Great Many Workers To Go Back To Their Homes —Or Anywhere Else, For That Matter.

We're at a new point in the evolution of work. At first, all work was done "on the road," as hunter-gatherers made the best living they could from the local environment. Later, all work was done "at home" as farmers grew their own food, or later grew crops and raised animals for sale. A hundred years ago, or so, the best paid work began to be done "in the office"—or the factory—as the industrial revolution created technology that suddenly required workers to travel to a central location before they could be productive.

Today, the post-industrial revolution is creating technology that allows a great many workers to go back to their homes—or anywhere else, for that matter—and in many ways be just as productive as they could be at the central office. Such an approach helps employers increase competitiveness by lowering costs, speeding innovation, and increasing customer satisfaction.

Much as multimedia is now said to portend the death of books, telecommunication has long been hailed as the end of geography.

We have a term for the work that is central to a business or organization and that is done by groups or teams of people who are separated from each other in time or space. We call it: "distributed" work. The out-sourcing of support activities is deliberately excluded from this definition.

However, we can use a slightly broader term, "distance work," to describe not only distributed work but the same general type of activities done by the same type of team when the work at hand is less central to the main mission of a large organization. For example, a one-time project or study by a major organization, or efforts to develop a startup business by a band of entrepreneurs would be distance work rather than distributed work.

In this sense, we can see telecommuting as just one of many possible human resource management methods that allow work to be distributed or done at a distance more effectively.

The vast majority of distributed and distance workers are "knowledge workers." Management consultant Peter Drucker defines such people as those who do work that requires the use of mental power rather than muscle power. Their predominance in distance work will probably be the case for many years, as muscle-based work these days generally involves far too much capital equipment and raw materials to be done efficiently anywhere but at a central location.

But being limited to knowledge work is not much of a restriction. Parts of nearly every job involve knowledge work, and are thus ripe for innovation or restructuring that lets people do them at a distance.

As mentioned months ago, tasks that are perfectly appropriate for distributed or distance work include such intellectual activities as: analyzing, auditing, comparing/contrasting, creating, modifying, planning, problem solving, thinking, and visualizing; plus such physical activities as: contract preparation/analysis, correspondence, data entry/correction/manipulation, designing, filling in/processing forms, meeting via telephone or other medium, numerical/financial calculations, project analysis/management, reading/studying, record keeping, researching/fact checking, sales/contact, telephone answering/customer service, and writing/typing. There are probably more.

While distance work success stories continue to pile up, uncertainties remain. Employers are concerned about how to manage and measure the productivity of distance workers, as well as how to educate and train them to stay in step with evolving corporate procedures, technology, and policies. There are also concerns about coordinating and controlling the work done at a distance from the main office, and about legal issues which—although quiescent so far—potentially pose insurmountable problems for organizations that dare to rely on telecommuting and distance work.

As employers become more comfortable with distance work, the distances are beginning to grow larger. Companies like Dell Computers, Best Western International, American Express, and dozens of others are actually employing people who "telecommute" from one country to another! This arrangement, rare among telecommuters today, is likely to become much more common as corporations battle to retain the most talented employees at the lowest possible cost.

Naturally, I'll have more details on all aspects of this developing phenomenon in future articles.

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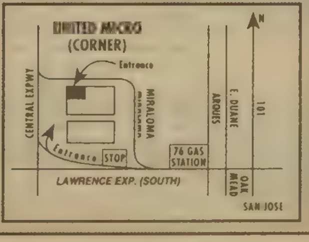

Telecommuting...*continued*

Paradigm Shift

Much as multimedia is now said to portend the death of books, telecommunication has long been hailed as the end of geography. But so far the opposite has occurred; by making almost any point on Earth accessible for a few dollars via a telephone or a point-and-click menu on a personal computer, the global network has led to the "explosion of place." That's the word from the editors at *TeleGepgraphy*, which does as annual survey of telecommunications markets. Drawing on the results of this survey, the editors go on to say:

> In a very practical sense, one can now live, work, maintain relationships, go to school, and even shop almost anywhere on the planet—certainly anywhere within California and the United States—without very much regard to physical, geographical constraints. As network services and resources continue to proliferate and grow easier to use, this phenomenon will only become more, not less, routine.
>
> In a sense, travel or geography has become the common content of computer networks. Hence as the Canadian scholar Marshall McLuhan first noted, rather than obliterating older forms, a new medium takes as its content the medium it replaces. Music and drama were the staples of early radio. Television gave new life to movies. And so telecommunications, particularly voice and data networks, by abolishing the importance of the distance between individuals—whether working or playing—has given us a new online geography of disembodied electronic mailboxes, meeting rooms, malls, highways, and frontiers.

> …we can see telecommuting as just one of many possible human resource management methods that allow work to be distributed or done at a distance more effectively.

The challenge of navigating this new electronic terrain is attracting the attention of telecommunications companies and computer communities alike. Traffic on computer networks has grown dramatically since the early 1990s, spurred in part by the development of more user-friendly navigational tools or screen interfaces. As Bruce R. Schatz and Joseph B. Hardin wrote in the August 12, 1994, issue of *Science* magazine, computer networks have been transformed from networks of machines into a distributed "information space."

The pair says this means users can now "concentrate on the logical structure of the

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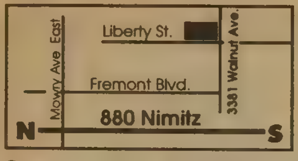

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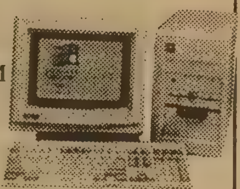

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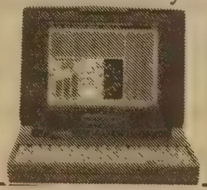

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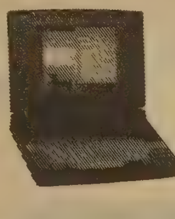

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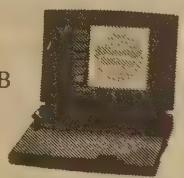

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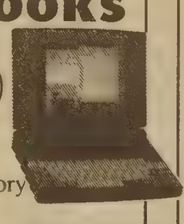

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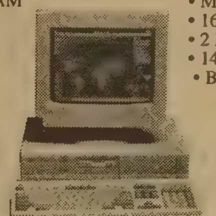

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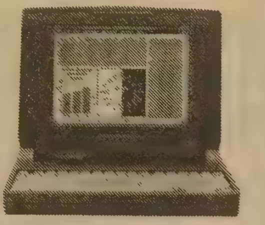

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interconnection of information and data items rather than the underlying physical structure of computer and communication systems." In practical terms, there is plenty of network capacity and very good network connectivity. So the typical user no longer needs expertise at simply navigating the network as much as he or she needs an understanding of how the information is organized and arranged. Network geography has become information geography. Or, to put it more simply, the physical location of the information on a network is almost entirely irrelevant, users are far more interested in identifying the resources they want rather than "finding" them (in the traditional, physical sense).

The problem, of course, is how can users orient themselves in this new information space? According to Zachary Schrag, deputy editor of *TeleGeography*, a publication which chronicles and maps the international flow of telecommunications and which ponders just this sort of theoretical issue, our current text-based interface with computer networks is being challenged by two movements: one offering graphical user interfaces based on geography (geoGUIs) to make network information more visible; another developing "intelligent agents" designed to make the computer networks invisible.

Little is presently said, or known, about how geoGUIs will ultimately operate. Agents, however, are much further along in development. Like computer macros and scripts, agents let computer users automate repetitive tasks such as logging onto a computer system or downloading information from a database. Unlike macros, agents also can go beyond a local computer to the network itself, retrieving information, sending messages, and perhaps even conducting business.

Maps and agents both have a future in cyberspace; the challenge is to know when to use a geoGUI, when to use an agent, and when to use other means and methods to most effectively, metaphorically "travel" the network to one's desired information destinations.

(The above discussion was edited, expanded, and excerpted with permission from *TeleGeography 1994*, published by TeleGeography, Inc., Washington, D.C.)

Report On Governmental Activities

According to Dr. Charles Grantham, of the Institute for the Study of Distributed Work in Oakland, CA, the European Union is much farther ahead than the US and even California in promoting the use of distance work to aid economic development in both suburban and rural areas, as well as to extend the reach of educational institutions farther out from central cities. They're also making progress in using telework for easing the entry of disabled, elderly, and others into the work force.

One reason, reportedly, is money. In its 1995 fiscal year, the European Union is going to spend more than $80 million on programs to help the disabled and elderly do more with telecommuting, and another $60 million to aid small- and medium-sized businesses do the same. This is far

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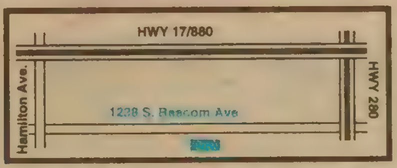

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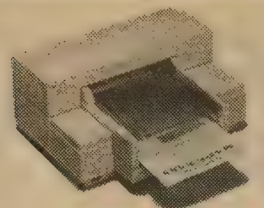

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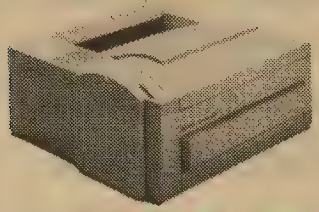

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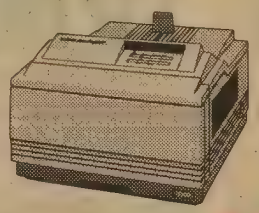

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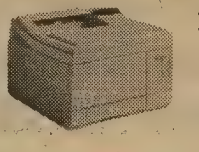

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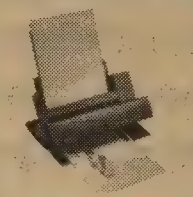

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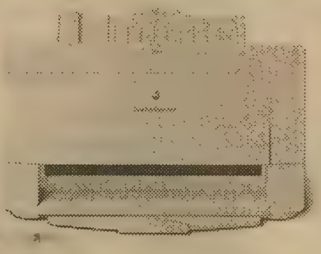

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more seed money than our government is putting into comparable projects, despite what Al Gore tells you.

In addition, the Europeans seem much more organized and focused to Dr. Grantham, who recently spent several weeks visiting and consulting in and around Vienna—one of the "hot spots" for global telecommunications these days.

He claims it is now easier to promote telecommuting between two European nations than between California and a neighboring state, such as Arizona or Nevada. This is downright dangerous, as our country initially grew strong in its formative years by transforming itself into a single market with few if any barriers to interstate commerce. Today, local telecommuting authorities are in danger of getting in each others' way as they battle for limited federal funding, for greater authority, and for tighter control over telecommuting activities within their respective regions.

If you need an example, look no further than Southern California. There, the Telecommuting Partnership sprang up after the January 1994 earthquake to promote telecommuting. It accepted several million dollars from the Department of Commerce, and busily set about doing a "needs analysis" with regard to telecommuting in the region.

A few months later, the Southern California Association of Governments formed the Southern California Economic Partnership, which included a "telecommunications cluster" to promote telecommuting. It accepted a $250,000 grant from CalTrans, and busily set about doing a "needs analysis" with regard to telecommuting in the region.

Both sides claim to be coordinating with all other agencies and government bodies in the region, yet each seems to be building separate but redundant administrative structures and doing separate but redundant investigations into where and how money could best be spent.

One questions whether telecommuting "needs analyses" are focused on the needs of telecommuters, or on the needs of favorably connected telecommuting experts and consultants.

Is it possible, innocent readers, that this could be the beginning of another example of government waste, boondoggling, and outright incompetence that not only fails to promote a needed activity—in this case, telecommuting—but actually impedes progress that independent activists might otherwise make?

I'm hopeful that good work will be accomplished here, of course, and I'll be sure to keep you posted as both of these new but optimistic governmental agencies ramp themselves up to their full size and budgetary limits.

Blue Line Televillage—Update

Thanks to all of you who contacted Los Angeles' Metropolitan Transportation Authority regarding the stalled Blue Line

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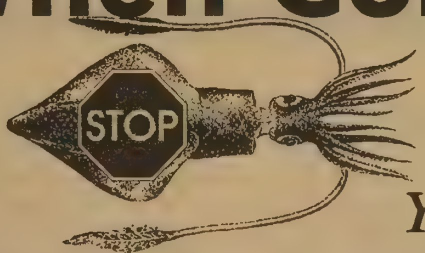

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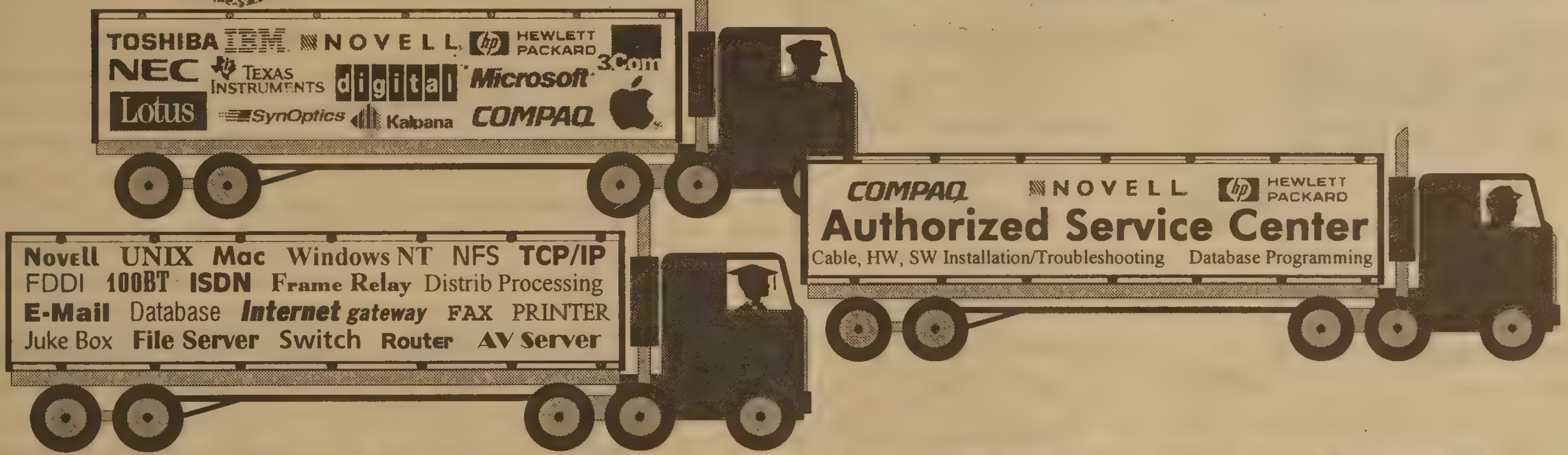
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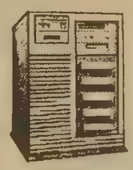

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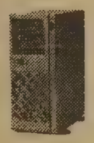

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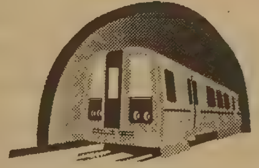

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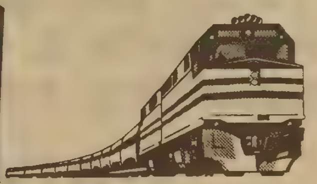

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Telecommuting...*continued*

Televillage Project, as mentioned in a previous article. After much bureaucratic manipulation, funding for the Televillage Project Coordinator's position has at last been found, and the project's $559,000 budget, bolstered by in-kind grants and contributions from participating organizations and institutions, now seems likely to be expended on the experiment.

As you remember, the Blue Line Televillage is considered by many to be "the single most innovative application of telecommuting and telecommunications in the world today!"

It will attempt to make good use of the excess capacity presently available within the fiber optic system initially installed to provide a channel for video security camera signals and other railroad control functions along the Blue Line rail right of way that runs from the downtown area of Los Angeles to Long Beach, some twenty miles away.

Over a period of twenty months, the Televillage project will provide no-fee and low-fee opportunities for residents along the Blue Line to make use of existing and yet-to-be-installed facilities such as workstations, meeting rooms, and a variety of automated devices.

> The European Union is much farther ahead than the US and even California in promoting the use of distance work.

As always, I'll keep you posted on further developments regarding the Blue Line Televillage as they occur (or fail to occur).

Global Village '95

A symposium to discuss aspects of building a Global Village is scheduled for February 7–10, 1995, in Vienna, Austria, and I am an invited speaker. This meeting is one in a series of conferences, discussions, and symposia to examine the possible spatial and social patterns that living and working facilities should take on in the information age.

Vienna is a laboratory for experiments along these lines, particularly since rapid development is now taking place in the relatively open lands north of the Danube, an area that offers commuters very limited access to jobs in downtown Vienna because there are only five bridges over the river.

Telecommuting would seem an obvious strategy, and in fact is being examined both by Global Village '95 organizers and the Vienna City Planning Department, with emphasis on its social, physical, and technological requirements. All these concerns will be topics for discussion at the conference.

In addition, there will be a "distributed" public exhibition from February 2 to 10 in Vienna's City Hall and also a large shopping mall some distance away.

Global Village events tend to provide a great deal of "cutting edge" information on both practical and theoretical aspects of telecommuting. You'll get a full report on all this in an upcoming article. ■

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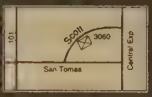

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Sales Tax On Computer Software

To tax or not to tax computer software? Conflicting legal decisions in different states reflect the difficulty that courts have had in resolving this question. Sales tax controversies often arise over whether it is taxable as a transfer of tangible property, or whether it is a nobler, nontaxable transaction involving intellectual property.

California imposes a sales tax on the transfer of software under some circumstances. The sales tax generally applies to retail sale of tangible personal property and select services. Intellectual property such as the logic or intelligence of a computer program, however, is intangible and therefore eludes the California sales tax.

To put the quandary in perspective, consider that books, VCR tapes, CDs, and records embody intangible rights, but are clearly taxable. The personal services of an architect, gardener, or systems analyst, however, are not. Similarly, sales tax is charged when you buy a box of canned, "off-the-shelf" software at the corner mall. But should a programmer or developer delivering a floppy disk containing months and years of personal services be subject to a tax on tangible property? How does the tax law recognize the difference?

The central guidance is found in a dramatic little text with a snappy title, California State Board of Equalization Regulation No. 1502, Sales and Use Tax Regulations: Computers, Programs, and Data Processing (see endbar).

This gem, which establishes when computer software and output is subject to sales tax, is cited in virtually every court decision involving sales taxation of software. A brief summary is provided here for those in the position of selling, reselling, or buying software or programming services.

Custom Versus Prewritten Software

Off-the-shelf software is taxable. The tax applies to the full amount charged the customer, including license fees, site licensing, other end-user fees, and documentation; as well as maintenance or service contracts that don't cost extra. If, however, the purchaser has an option to pay extra for consultation services, those additional support services aren't taxed.

On the other hand, sales tax does not apply to a custom computer program (other than a basic operational program).

The definition is important here. A custom computer program is defined as "a program prepared to the special order of the customer even though it may incorporate preexisting routines, utilities, or similar program components. It includes those services represented by separately stated charges for modifications to an existing prewrittten program which are prepared to the special order of the customer."

Thus, if you develop software made to order, it isn't taxed even if it includes chunks and dribs and drabs of things that weren't necessarily custom jobs. The documentation you provide with a custom program is also exempt.

In determining whether software is canned or custom, the courts have held that the answer may be "none of the above." Once a program has been created, is in the possession of the original customer, and the design and development completed, the software program itself has become a tangible personal asset. Its subsequent transfer by that buyer will be taxed.

In one impressive local case, Kaiser Industries sold all the assets of its engineering division to another company, including an extensive library of customized programs that they had developed for internal business use. The transfer of the software library was found to be a taxable sale of tangible personal property. Indeed, the regulations specifically command that a "prewritten" (taxable) program includes not only one held for repeated or general sale but "also...a program developed for in-house use which is subsequently offered for sale or lease as a product."

The distinction between tangible and intangible was noted recently in a case decided by the California Court of Appeals, which pronounced that if an item is "(1) not solely the embodiment or expression of an idea, (2) physically useful in the manufacturing process, and (3) not supplied as an incident to providing service, it is taxable as tangible personal property."

Although custom programming services are free of the tax, some defensive bookkeeping by code writers and developers is nevertheless called for. If you charge a client to make minor modifications to prewritten software, those modifications are nontaxable only if your invoice separately itemizes the charges as your services. Forget to do so, and both the program and the modifications will be taxed.

On the other hand, if fees for modification of a prewritten program are not separately stated, and if the changes are so significant that the result qualifies as a new custom program, it won't be taxed at all. A magic formula even specifies that, in order to qualify, the price of the modified program must be at least twice that of the unmodified, canned program you started with. In other words, the value added must

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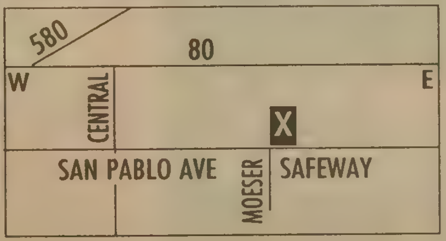

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at least equal the cost of the raw software ingredients.

Although shrink-wrapped, store-bought software is taxable, the regulations provide a surprisingly generous loophole. The sale of a prewritten program is not a taxable transaction if you transfer the program by modem from your place of business to the customer's computer, without physically delivering the software on storage media. It wouldn't take much to shove an entire camel through the eye of that needle.

Computer-Generated Output

The sale of computer-generated output is subject to sales tax if the output is the true object of the contract, such as artwork, graphics, and designs. Similarly, your fees for data entry and verification are taxable.

Data processors, however, often rely on the rule that charges for processing customer-furnished information are not taxable. Moreover, regulations state that computer graphics produced in connection with the performance of architectural, engineering, accounting, or similar professional services are not subject to sales tax, because they are considered to be furnished incidentally to the performance of a service.

In some cases, the original output is not taxed, but the client requests a number of copies. If that's the case, charges for making those additional copies are taxed, even if it's not separately stated on the invoice.

To illustrate, consider a fictitious hardware engineer using CAD software to design the layout of components on a circuit board from schematic diagrams provided by a client. Upon completion, the engineer delivers a photoplot that the client uses to manufacture boards in-house. Sometimes the engineer modems designs to the client, and the clients prepare their own photoplot.

There won't be a sales tax on the engineering design charges, regardless of whether those charges are separately itemized, a finished photoplot is delivered, or just a design is modemed. However, tax does apply to that portion of the charges relating to physical production of the photoplot itself. In order to avoid sales tax entirely, the engineer should modem the design rather than deliver camera-ready art such as a photoplot.

The Latest Word

In February 1993, the Superior Court in San Francisco refused to allow the Board of Equalization to impose a sales tax on copyrighted databases that were transferred on magnetic tape, to then be accessed by third parties. The Board had argued that the entire transaction was a taxable lease of magnetic tapes. The Court found, however, that the transfer of the right to sell access to the databases is an intangible right distinct from the tape itself.

This decision is highly favorable to the taxpayer, and differs from similar cases decided in other states. The Board of Equalization has plainly lost the round, and has appealed it. The appeal should be anxiously monitored by just about every Californian who transfers copyrighted databases, patents, trade secrets, know-how, and similar intangibles on magnetic or optical media. For readers wishing to follow the case more closely, the cite is *Unisys Corp. v. State Bd. of Equalization*, California Superior Court, San Francisco County, appeal docketed, No. A062663 (1993).

To reduce uncertainty in determining if a particular software transaction is subject to sales tax, look before leaping into a deal—especially in less familiar states. Aim to structure the transaction to conform to established guidelines and practices shown to pass muster in courts in that state. ■

Complimentary reprints
of the following are available from David Simon's office in Oakland at (510)893-5753.

Regulation No. 1502, Sales and Use Tax Regulations: Computers, Programs, and Data Processing (1988)

Walter Hellerstein, "State and Local Taxation of Intangibles Generates Increasing Controversy," *Journal of Taxation* (May 1994), reprinted with permission of the publisher, Warren Gorham Lamont.

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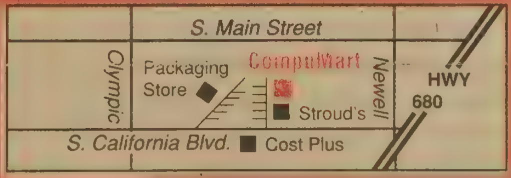

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OS/2 • BY FABIAN PASCAL

OS/2 3.0: A Warped Versioning Concept?

Plus: Cypress Pentium Notebook And OS/2; Even More Driver Hell

With much fanfare and hoopla, complete with a Star Trek team member denigrating an hourglass and a worldwide satellite show, IBM has recently launched OS/2 3.0, dubbed Warp.

It has always been my policy to write about products only after thorough use in realistic circumstances; given my experience with previous OS/2 versions, I see no reason to deviate from this practice. I shall review Warp's specific features gradually over time, avoiding the usual instant and rather superficial overviews in the trade press. For now, I will offer some preliminary comments and illustrations, onto which I can hang some updates to previous columns, as is befitting at year's end.

Warp—What's New?

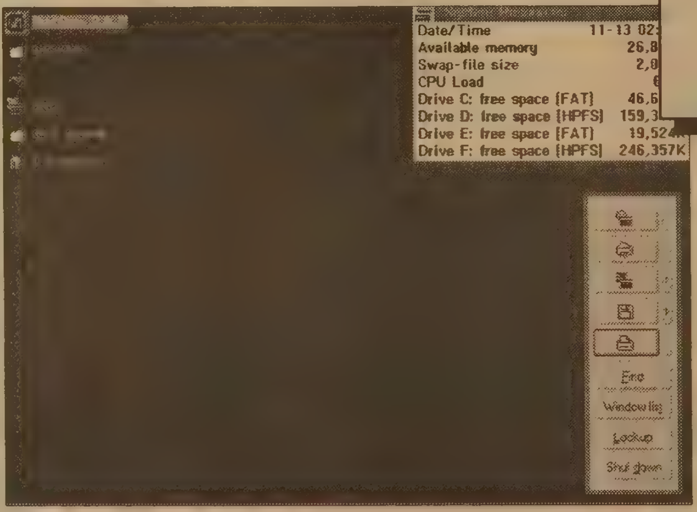
In its guide to reviewers, IBM describes Warp's following areas of improvement:

- Installation:
  - Easier
  - Better Device Driver Support
  - Enhanced Application Detection
- Usability:
  - New Tutorial
  - LaunchPad
  - WorkPlaceShell Enhancements
  - Expanded Cursor Options
  - Win32s 1.0 and 1.1 Application Support
  - VDM Configuration Enhancements
  - Expanded Multimedia Support
- Performance:
  - Smaller (memory) Footprint
  - WIN-OS2 Fast Load
- Reliability:
  - Configuration Archiving
  - Diagnostic Boot Cycle
  - Utility Diskette Creation
- Value-Added Features: BonusPak
  - Internet Connection
  - CompuServe Information Manager
  - HyperAccess Lite
  - IBM Works
  - Faxworks
  - Person to Person
  - Multimedia Viewer and Ultimedia Video IN
  - SYSINFO Tool

Looked at in more detail (more of that in future columns), these enhancements are all useful and welcome, but to those of us who have been with OS/2 since its inception they are mainly cosmetic, or long-overdue corrections of weaknesses. Do they really justify a full version point?

Take the usability enhancements. I don't find the LaunchPad (Figure 1) such a big deal when you can have all the icons (and pop-up menus) you want on the desktop; on small notebook screens, floating it on top—the most likely use—interferes with one's work. Or consider the animated folder icons, which now open: nice touch, but hardly substantial.

The installation, performance, and reliability enhancements should not have taken that long. And the BonusPak cannot substitute for the dearth of native, efficient, OS/2-exploiting full-fledged applications in almost all important niches (the FaxWorks Lite in the BonusPak, for example, is a 16-bit version of the application, with generic modem support, which does not support my Intel SatisFAXtion fax modem).



```
Date/Time                         11-13 02:
Available memory                      26,8
Swap-file size                         2,0
CPU Load                                 6
Drive C: free space [FAT]             46,6
Drive D: free space [HPFS]           159,3
Drive E: free space [FAT]            19,524
Drive F: free space [HPFS]          246,357K
```

Given its touted reduced memory consumption and enhanced portability, I installed Warp and played a bit with it on a Cypress 3600 Pentium laptop. The second column in Table 1 shows how it fares on the OS/2 requirements.

If Warp is your first foray into OS/2, the just-released Warp for Windows installs over DOS/Windows. If you don't use Windows, but want to be able to run Windows applications under OS/2 anyway, you must wait for the "full" Warp version that comes with its own Windows emulator, WIN-OS2, expected in 1995.

table #1

	Minimal Recommendations	Cypress Notebook 3600
CPU:	>=486/DX4	Pentium
	100MHz	66MHz
	128K cache	Y
Bus	PCI or ISA+VLB	ISA+VLB
PCMCIA	>= 2II/1III	Y
	OS/2 Socket Services	N
Memory	min. 16MB	[8]/16/24/40
	<= 70ns	70ns
Video	>= 10" screen	see below
	dual-scan color	10.3"
	active-matrix color	9.5"
	>= 1MB VRAM	1MB
	ext. SVGA port	1280x1024
	OS/2 SVGA driver	N
	(detachable LCD)	N
Storage	>= 200MB	258/340/540/720/810
	acc. time as low as possible	~12ms
	xfr. rate as high as possible	8.3MB/sec
	internal floppy	Y
Power	battery: >3-4 hrs.	1 hr.
	hot swap	N
	OS/2 intelligent power mgmt	N (no APM)
	resume mode	N
	universal AC (built-in)	Y (N)

Table 1: Cypress 3600 vs. OS/2 Requirements

In either case you can take advantage of Warp's new Easy Installation option if and only if:

- you want OS/2 installed on drive C: (I don't)
- you don't want HPFS support (I do)
- you want Boot Manager installed (I do)
- you don't have Windows installed (I don't)
- you want all OS/2 features installed (I don't)

Then, if Warp identifies and supports your hardware configuration, the installation is effectively a one-key step. Otherwise, you must use the Advanced installation.

Warp comes with more built-in hardware drivers than OS/2 2.x but, depending on your specific configuration, you may still run into problems. For example, like its predecessor, Warp does not install on the

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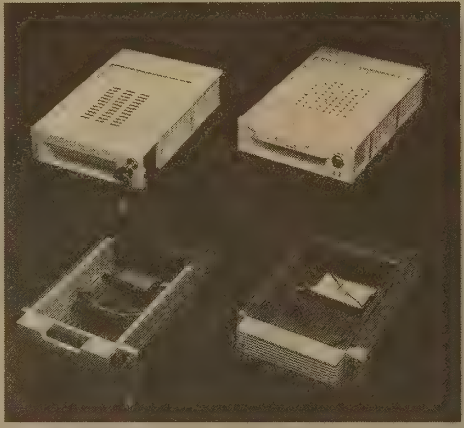

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OS/2 *continued*

Hewlett-Packard Omnibook subnotebooks, which have various proprietary components; and see below.

If you are upgrading to Warp from a previous version of OS/2, you will want to preserve your customization, as it is tedious and wasteful to manually recreate it (hardware, session settings, applications, desktop). To that end you must opt for the same "type" of Warp as your older OS/2 version, but by preserving customization you may forfeit some of the Warp improvements. For example, I have OS/2 2.11 with WIN-OS2 version, so I must wait for the equivalent Warp version. I replaced standard folder icons with more descriptive ones, but after the upgrade they will not open, like Warp's standard ones.

It is not clear yet whether customized setups can be restored after Warp installation from OS/2 2.x backups. Restores by Iomega Backup, reviewed in a previous column, seem to work, but the program does not have a Desktop backup option (MSR's version of the program, BackMaster, did not work). MultiMaint, which I described in the last column, has a Portable Desktop Backup feature which its author describes as follows:
"A [regular] Desktop Backup is basically just zipping files, directories and the associated EAs... The Portable Backup is accomplished by doing somewhat the same thing, i.e. copying the INI files and EAs for the Desktop, but [its] heart is the *.WPS file which is built by creating an Agent WPS object and using that object to call a large number of different WPS methods for each of the objects on the Desktop. That way, each of the objects is seen through the eyes of WPS and the Restore can also be done the same way. Since the WPS interface is consistent across versions of OS/2 and independent of the type of video etc., this Backup can be used across versions and machines. In addition, because of the way the information is saved, the Portable Backup can be used to Restore pieces of the Desktop, rather than the whole thing."

The BonusPak cannot substitute for the dearth of native, efficient, OS/2-exploiting full-fledged applications in almost all important niches.

I received the latest version, 3.3, too late to try for this column.

The Cypress Notebook 3600

At 11" x 10" x 2.3" and about 9lbs. with battery and AC adapter, the 3600 is a laptop rather than notebook. As with the 486 notebook I reviewed in a previous column, the keyboard would benefit from some travel, click, and larger keys, but two collapsible legs provide at least some angle. The trackball is now more conveniently centered on the home keys, but I still believe that trackballs and other weird pointing devices should be replaced by cordless mice with integrated receivers. The PCMCIA slots are now on both sides of the machine, as some Type III cards are bulky and block the Type II slot if the slots are one on top of the other.

My unit had a 66MHz Pentium, 40MB of RAM, a 540MB hard disk, and a 10.3" dual-scan LCD color screen (recommended). The Advanced Installation was smooth. While Warp claims to run in as little as 4MB of RAM, I have not lowered the minimum memory requirement for OS/2, because multitasking DOS, Windows, and OS/2 applications—which is what OS/2 is all about—will need more, particularly since OS/2 native applications must yet become efficient.

The port for external monitors supports resolutions of up to 1280 x 1024, but the OS/2 video driver from Cirrus Logic, necessary for SVGA, is still the one for OS/2 2.0, which did not work even with 2.1. Performance was, as you can imagine, very good, but video performance could not be evaluated, because the video tests of the OS/2 benchmarking program crashed under Warp. The configurable Comet Cursor is nice, but for some strange reason it would not work unless I just accessed—without doing anything!—its Notebook of Settings first.

Warp supports Advanced Power Management, and it would benefit from its presence, as well as from a suspend—or resume—mode. But currently, notebooks support these features for DOS/Windows only. The 3600 comes with one metal hydride battery, which is not hot-swappable. I got about one hour's worth of continuous work out of the battery.

PCMCIA

PCMCIA support is more standardized than other hardware aspects. It, therefore, can serve perhaps better than anything else to illustrate the kind of hardware support problems that have plagued OS/2 since its inception.

Here is how PCMCIA is intended to work:

- Notebook manufacturers must provide, for every supported OS, Socket Services (SS), a device driver for accessing/interfacing with the machine's (vendor-specific) PCMCIA controller chip.
- Card manufacturers must provide a Client Device Driver (CDD), which knows how to identify and initialize specific cards.
- The OS must provide Card Services (CS), "an industry-standard interface layer between CDDs and the platform-specific CS," and a driver for allocating resources on behalf of CS.

But reality is different. IBM works with notebook makers to build OS/2 SS for their machines, but the fact is that only a handful, mostly major vendors, have participated in this endeavor. Cypress is in the vast majority of vendors who offer SS only for DOS and Windows.

In such cases an OS/2 SS driver for a machine based on the same chipset—here Cirrus Logic—might work, but that is basically a matter of luck. Warp's CS consists of two drivers, PCMCIA.SYS and VPCMCIA.SYS, and a Resource Manager. Like notebook manufacturers, many card makers do not provide OS/2 CDDs either, and this is true for the Megahertz XJ2144 fax modem card I have. A README file states as follows:

INSTALLATION INSTRUCTIONS FOR
MEGAHERTZ PCMCIA MODEMS
Megahertz Corporation INSTALL V1.2B
January 26, 1994

This document describes how to install Megahertz PCMCIA modems for a variety of environments.
*** If your laptop is an IBM ThinkPad and you are running the OS/2 2.1 operating system, refer to section 1.*
*** If your laptop is NOT an IBM ThinkPad and you are running the OS/2 2.1 operating system, refer to section 2.*

Unfortunately, here's section 2:

SECTION 2: OS/2 2.1 On Non-IBM Laptops

At this time, the Socket Service drivers which are required for OS/2 2.1 PCMCIA support are available only from IBM and are supplied only with IBM ThinkPad computers. However, IBM is working with leading laptop manufacturers to make OS/2 2.1 Socket Services available on non-ThinkPad laptops. When this happens, the instructions above in section 1 should work for non-ThinkPads as well as ThinkPads.

Please contact your laptop manufacturer for information about availability of PCMCIA Socket Services under OS/2 2.1 for your laptop.

To resolve such problems, IBM has equipped Warp with a Super Client Device Driver for PCMCIA cards, "capable of recognizing most PCMCIA modems." For a compatible PCMCIA configuration, Warp can automatically install the PCMCIA drivers and Plug & Play, IBM's "OS/2 [PM] application (also known as Play at Will, EZPLAY, or Configuration Manager) that displays PC card information, socket status, assigned resources and card type."

The OS/2 installation program lists the machines for which SS drivers are provided and prompts you to select one. Based on the beta version of the PCMCIA drivers that I used for my previous Cypress review, I knew that three of the listed notebooks—Panasonic/Matsushita, Compaq Concerto, and NEC Versa E—were based on the Cirrus Logic chipset, and thus their SS had a chance of working.

But neither did. With the Compaq SS, Plug & Play would not even recognize the Megahertz XJ2144 fax modem inserted in the socket; with the two other drivers it would show the slots, and the modem as "Ready," but three communication programs refused to even dial.

No-Man's Land

IBM investigated the matter and sent some documentation that listed three other Megahertz modems supported by OS/2, but not the XJ2144. They stated that "older

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OS/2 *continued*

Megahertz modems" are not supported, but the XJ2144 is actually newer than the three listed.

Megahertz's reaction was:

Megahertz does not provide any PCMCIA drivers for OS/2 at all. The "Play at Will" drivers provided by IBM do however provide support under OS/2 for most PCMCIA controllers. I do not know what drivers you are using or what drivers you have attempted but would like to recommend you try the following:

1) OS2PCM.ZIP (available from the IBM BBS) is BETA Play at Will drivers. You should try this first.

2) UTTPS.EXE is the latest ThinkPad Utility disk and contains the very latest (released in past several weeks) IBM drivers for ThinkPad. It is version 2.0 I believe.

But 1) is what I used in my previous Cypress review, and it did not work even with OS/2 2.x; besides, the Warp drivers are more recent than the beta. As to 2), there is no reason to expect that a ThinkPad SS would fare any better with the Cypress than SS drivers for the same chipset and, given IBM's official "no support" policy, I saw no point in downloading the UTTPS.EXE large, and thus expensive, file.

I've installed Warp on my desktop and have quite a few things to report. Stay tuned; but in the meantime, users of OS/2 2.1x should keep it running in parallel until they make sure everything works under Warp. (My thanks to Cypress Computer, IBM's OS/2 Media Support, and Larry Martin, the developer of MultiMaint, for their help with this article.)■

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RESOURCES:

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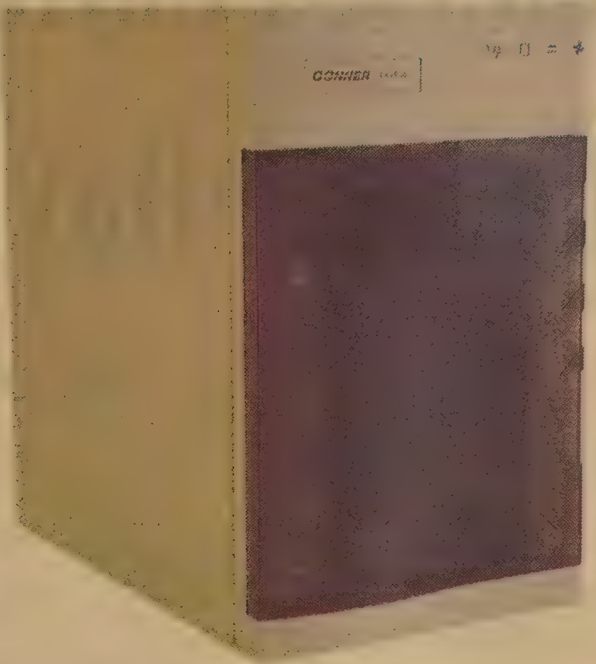

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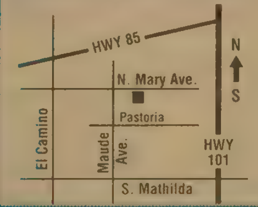

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BMUG

Software Invaders, Pentium Bugs, And Other Modern-Day Hazards

By David Morgenstern

This month we bathe in the glory of corporate screwups as well as a warning to be on the lookout for a possible programmatic intruder. Put on your sunglasses.

"Little troubles are really not so bad—for someone else," said Sholem Aleichem, sometimes called the Jewish Mark Twain. But in the realm of computers, "little" takes on a new meaning. It's hard to grasp the concept when the building blocks are sub-microscopic, and the data stream is electronic. But users don't look at the detailed blueprints of our silicon architecture. Users want computers to do what they do best—the digital stuff, the finger work, er... calculations.

Unfortunately for the users that are required to clean up an input-output mess, the results of messy calculations are huge, even when only involving the smallest fraction. We expect a lot from our computational buddies, but an error is an error.

Our world is a tough place to find perfection; it's a rare commodity in machines or human beings. Take as an example the difficulties surrounding International World Standards Day.

In most countries, the day is celebrated on October 14. However, in the United States we observe it on the 11th, in Finland on the 13th. Italy needed a byte longer and held its conference on the 18th. Someone should take a stand on this! Perhaps a handstand.

Trojan Horse Sense

In early December, a warning went out over the Internet about a possible new Trojan Horse program. Like their more intelligent cousin, the computer virus, Trojan Horse programs can cause serious damage to a user's system.

Trojan Horses are software hand grenades that explode upon activation. They usually perform some negative action like formatting your hard drive or changing the names and creation dates of all your files! The programs almost always have an interesting name and usually toss up a slide show while they are proceeding with their dirty business.

The latest offender was reported on the America Online service and was called Good Times. Just as with the blasting cap tempting children in the sand lot, follow the wise saying: If you see one don't touch it. Or download it.

Many people mistakenly refer to Trojan Horses as computer viruses. The difference between the two is great. A virus has the ability to replicate itself and uses many schemes to spread itself from disk to disk or across networks. Their destruction is most often caused as a by-product of their writing themselves willy-nilly around your hard drive.

On the other hand, Trojan Horses are more simple, and spread themselves only by the unwitting help of their victims. But often their action is more sudden and destructive than that of viruses.

The only virus to make the scene this past year was INIT 9403 virus, that surfaced in Italy last March. It broke the rule and erased or messed up connected drives. Fortunately, it only worked under the Italian version of the Mac operating system.

All Mac users, and really all computer users, should run some form of anti-virus program. One of the best for the Mac is Disinfectant, which is free! The latest version is always available on the Utility V1 floppy disk from the BMUG office for $3 plus $4 shipping and handling, or from BMUG's membership online service, Planet BMUG.

The Error Of Bad Tidings

It's time for our Scholastic Aptitude refresher. Remember the word, *Schadenfreude*? It's a German term that refers to the malicious joy we feel when something bad happens to somebody else. It's the root of slapstick comedy and burlesque—the smile that comes to our mug when the pie splashes over the bride at the wedding banquet, or watching someone else, for a change, having to deal with a fool.

So what does this byte of language instruction have to do with computers? Hello, Intel! ...

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Only if you were stuck in a coma for the past month could you have missed the great Pentium processor scandal. Scientists discovered that the chip had a flaw in its floating-point unit that caused an error when handling complex calculations. Sometimes.

The bug is definitely in the Pentium chip itself and not in system or application software. Instead of a correct number down to eight or nine decimal places, the chip, on rare occasions, chokes and comes in with a slightly false value.

Intel has made changes to the chip's Program Logic Array that fixes the math bug, but it will be a while before these reach users. Intel estimated that between half and two-thirds of the 5.5 million Pentium chips it will ship this year are flawed. There are additional problems with a souped-up version that can give problems when in a multiprocessing environment.

Although most users do not need such a high level of accuracy when balancing a checkbook or an ordinary spreadsheet, the problem has scientists alarmed. They need everything to be accurate down to the *n*th degree when measuring itsy-bitsy changes, as well as utterly reliable for long-term experiments. The Pentium problem may also give problems to the internal operation and calculations of math-intensive applications.

This news story was spread far and wide, from small-town papers to local television news reports. Reporters and news readers took a break from man-bites-dog and O.J.'s trial-of-the-century stories. It drove Intel stock down and zapped the entire techno-stock market for a while.

All of these problems are music to the ears of the PowerPC makers and Mac users. Can it be that there are some cracks in the Great Wall of Intel and Microsoft?

Some poor Mac users have had to wrestle management to be able to use a Mac in the office. Years ago at BMUG meetings, we would share stories of reverse-theft, hauling the Mac into the office at night through the back door. Macs have become big sellers in the academic, small office, desktop publishing, and now digital video markets. But the *Fortune* 500 market...

Users have had to push and push against some long-standing prejudices—that the Mac isn't "good" as a business machine; that it won't run this and that operating system; that it's just a "toy." Apple has tried to address these issues, but it's an uphill effort.

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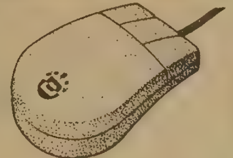

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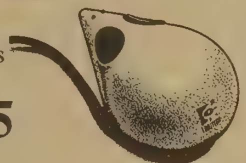

- Great for Kids and Adults
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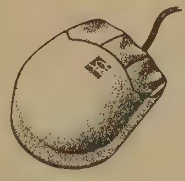

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- Includes Software

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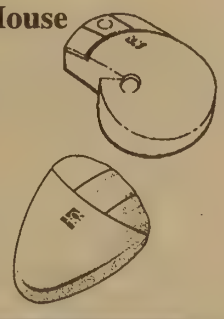

- Hi-Resolution
- 3-Button
- Radio waves see through objects on desk
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- The ultimate mouse
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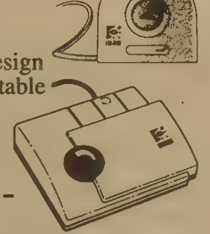

- Ideal for Portables
- Clamps to side of keyboard
- Thumb operated 3-button design
- Serial interface or PS2 adaptable
- Includes Software

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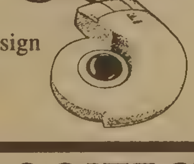

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- Hi-Res thumb ball design

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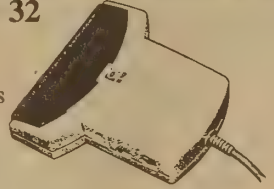

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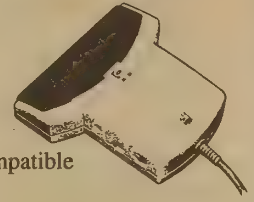

- For Windows
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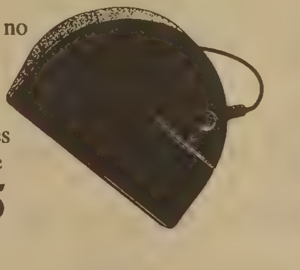

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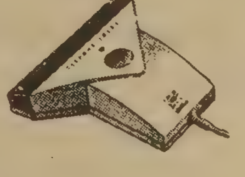

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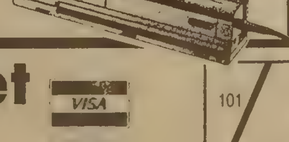
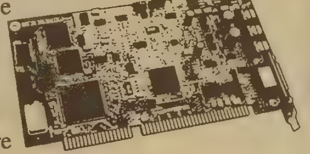


SOUND BOARDS

SoundMan 16



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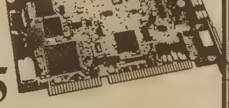

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- Includes Software

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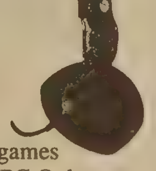

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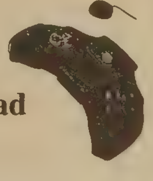

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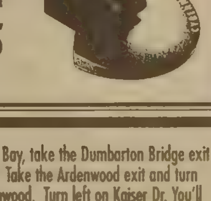

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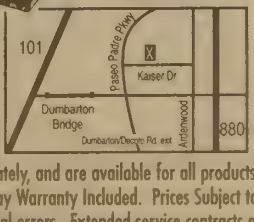

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BMUG Upcoming Events:

January 4–7 Visit BMUG booth at the Macworld Expo in San Francisco.

January 5 Special Macworld Expo Meeting and Party Combo Blast at the Nikko Hotel ballroom, 222 Mason Street. Claris *ClarisDraw* and new stuff; Intuit new *Macintax* and *Quicken*; Connectix new *digital camera*.

January 12 Intergalactic Reality Galactomatic 1000 (data analysis); Now What Software *Small Blue Planet–the Cities Below* (cool CD atlas).

January 16 BMUG South at 1922 The Alameda, United Way Office in San Jose. Now What Software *Small Blue Planet–the Cities Below* (cool CD atlas).

January 19 Nisus *Nisus Writer 4.0* (word processing); Foresight Technology *FastPace Instant Contact* (PIM).

January 26 Microtech *ScanMaker IIsp* and DCR color calibration software; Nolo Press *WillMaker* and *Living Trust Maker*.

January 30 BMUG West at Exploratorium Science museum in San Francisco. Bit Jugglers *KidsWorld* (screen saver construction set).

Please Note: BMUG main meetings are held in 22 Warren Hall on the UC campus (near University and Oxford). Call the BMUG Announcement Line at (510)549-2684 ext. 8 for the latest news on meetings, special interest groups (SIGs), and seminars. See you there!

You could see the intensity of the fray at a recent BMUG meeting, when some members moaned over a recent rumor out of Japan on the possible first Mac clones. Bandai, a big Japanese toy maker, is reportedly going to go with the Mac operating system on a multimedia computer designed for kids. The new computer will use a special lightweight version of the PowerPC chip and will handle educational programs and games.

The members were not thrilled with this news! They felt that the announcement played along with the old stereotypes. Hey, kids are people too. Doesn't everyone deserve a chance at a really great computer interface?

The Pentium snafu creates a little psychological crack in the Intel/Microsoft marketing armor. It may put the small seed of doubt in the minds of management that may result in the Mac and future PowerPC-running computers getting a second look at evaluation time. What they need is a chance to prove themselves, instead of being simply dismissed out of hand.

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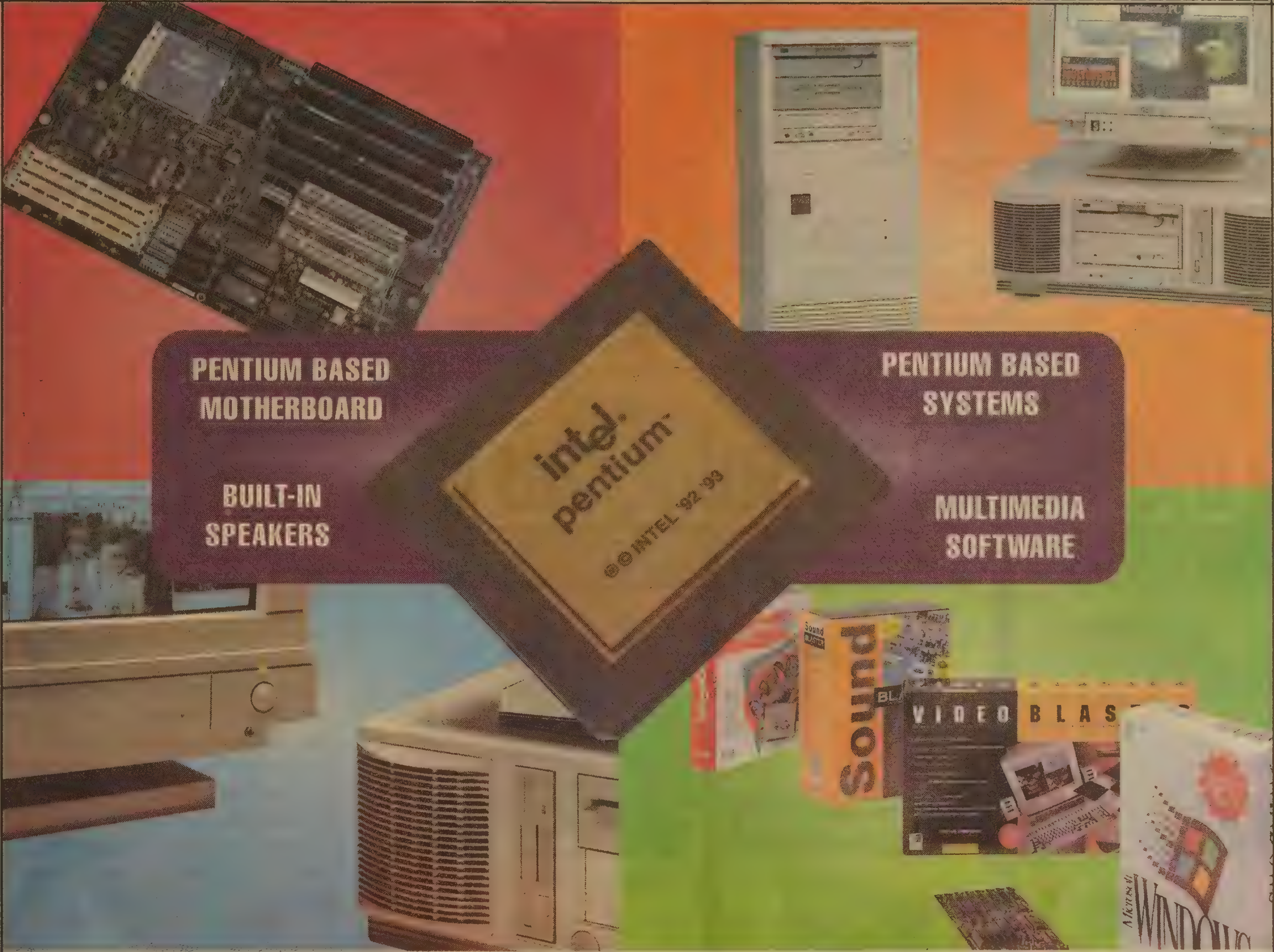

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Penti-yummy PR

The Net-based jokesters really outdid themselves with the fake press releases for the Pentium disaster. Here are a couple of the best:

- ***Pentium Blows November Election.***

An anonymous source in the Democratic Party has revealed that the sweeping landslide victory of the Republicans in November may have been due to an obscure bug in the Intel Pentium computer chip.

Upgrading the nationwide vote-counting system to the latest technology was one of Vice President Al Gore's "Reinventing Government" initiatives. This change was meant to reduce costs and streamline operations, however, the computer glitch may have cost the White House dearly.

A spokesman for the Democratic Party denied the rumor that several thousand PowerPC computers had been purchased as part of a vote recount effort.

When questioned about the news, Senator Bob Dole (R) commented that he believed the Intel Pentium chip was far better than anyone had thought. A short statement released by Newt Gingrich's office indicated that "the Democratic party has always sought to divide America and that this discovery of a floating-point division bug in the Intel Chip was clear evidence of the moral decay of our society."

At a Motorola Plant in Austin, Texas, Ross Perot told an angry crowd that according to his new calculations the deficit is actually 14 times larger than the government has been telling us. He praised his staff for staying up all night and performing the calculations by hand.

In late-breaking news today, legal briefs were filed in Chicago by former senator Dan Rostenkowski's attorneys which claimed that the irregularities at the House Bank and the House Post Office were actually due to Pentium chip calculation errors.

Sources in Attorney General Janet Reno's office revealed a furious behind-the-scenes effort to reload the Whitewater investigation spreadsheets in order to double-check the results.

- ***Intel (NASDAQ: INTC) today announced** a 3 for 1.99994562416 stock split effective Jan. 5, 1995, for stockholders of record as of Dec. 9, 1994. Although analysts were surprised about the strange ratio in the stock split, an Intel spokesman stated that "That's just the way the math worked out!"*

Intel also filed a motion with the Securities Exchange Commission requesting that it be allowed to publish its financial reports to only 1 or 2 significant digits.

"There are significant efficiencies to be gained, both in the preparation and printing of financial reports. Just as taxpayers can choose to file returns using the whole-dollar method, we feel we can get financial reports out much faster if we don't have to rerun all our spreadsheets through a PowerPC to verify them. Besides, most investors only care about the first 2 significant digits anyway!" the spokesman said.

In related news, Microsoft Corporation (NASDAQ: MSFT) announced that its chairman, Bill Gates, had filed for personal bankruptcy after discovering that his personal net worth had been overstated by approximately $8 billion due to an undisclosed computer glitch. ■

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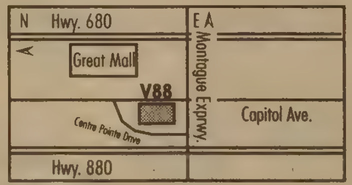

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What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its fifteen thousand international members. BMUG supports many special interest groups (SIGs), 18-line Planet BMUG and 11-line BMUG Boston BBSes, a software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 500-page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6:30–9:30 (or whenever we finish), on the UC campus. BMUG West and BMUG South are monthly meetings held in San Francisco and San Jose. Check the Announcement Line at (510) 549-2684 ext. 8.

The BMUG Office, 2055 Center Street (a half block from the BART station), is open to the public 8:30 am–4:30 pm. Please come by, say hello, and meet other members.

The BMUG Helpline provides volunteer technical assistance and telephonic handholding for our members. If your question can't be answered on the spot, we try to get you in touch with someone who can help. Improve your Macintosh education and help others by becoming a Helpline volunteer!

BMUG has one of the most up-to-date, comprehensive software libraries around with hundreds of disks filled with the latest versions of public domain or shareware programs. BMUG also produces CD-ROM collections, including the digital video *TV-ROM ™Too*, and the *BMUG PD-ROM.*

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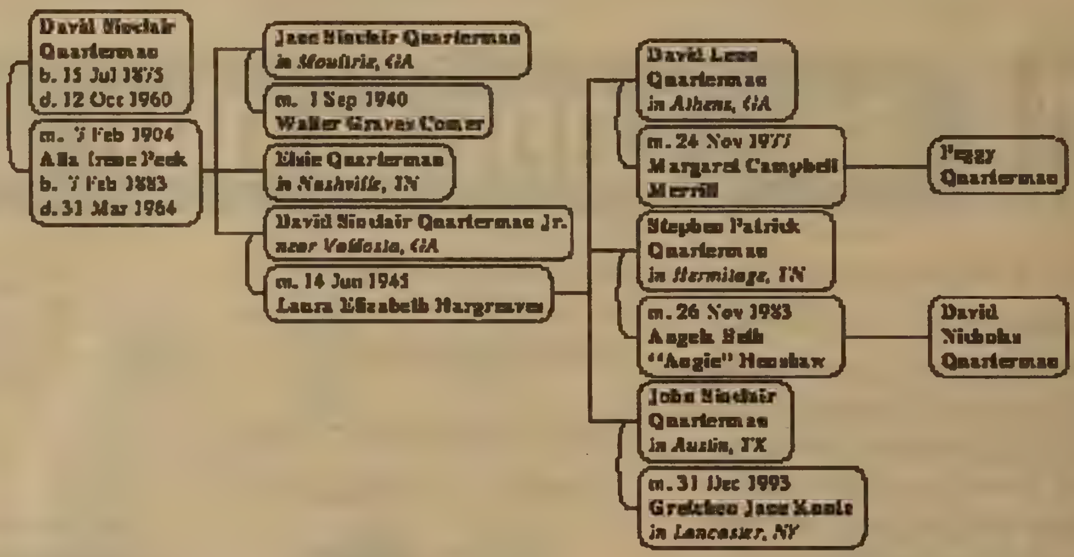
Family History On The Net

By John S. Quarterman and Smoot Carl-Mitchell

A few months ago we discussed distinctions between the Internet and the Matrix, and how various online providers and applications enter into the question. Let's look at a practical case that illustrates many of the points we made in that column.

Networks aren't just bits and bytes, and not all uses of them are academic research or for commercial profit. The Quarterman family uses them for a family history project.

All Descendants of David Sinclair Quarterman (1875–1960)


David Sinclair Quarterman
b. 15 Jul 1875
d. 12 Oct 1960
m. 7 Feb 1904
Alla Irene Peck
b. 7 Feb 1883
d. 31 Mar 1964
Jane Sinclair Quarterman
in Moultrie, GA
m. 1 Sep 1940
Walter Graves Comer
Elsie Quarterman
in Nashville, TN
David Sinclair Quarterman Jr.
near Valdosta, GA
m. 14 Jun 1945
Laura Elizabeth Hargreaves
David Leon Quarterman
in Athens, GA
m. 24 Nov 1977
Margaret Campbell Merrill
Peggy Quarterman
Stephen Patrick Quarterman
in Hermitage, TN
m. 26 Nov 1983
Angela Beth "Angie" Henshaw
David Nicholas Quarterman
John Sinclair Quarterman
in Austin, TX
m. 31 Dec 1993
Gretchen Jane Koole
in Lancaster, NY

dsq.ps 10/11; Fri Dec 21 7:32:39 1994 [gif]

Text: Aunt Elsie's Mailing List And Beyond

Aunt Elsie, in between reviewing botany textbooks, is transcribing letters written by our great-great-grandmother and some of her children around 1885. Elsie's first cousin, Helen the minister, had kept them until last year, when she chose to deposit them with us. Picking them up involved David Leon, John, and Gretchen driving six hours one November into the mountains of north Georgia. John later distributed photocopies by paper mail to everybody concerned. Elsie transcribes the letters on her PC in WordPerfect and mails them through her CompuServe account.

Elsie mails them to a mailing list that John set up on the TIC systems in Texas. Elsie's mail goes there and is automatically copied to John in Austin, Texas; to David Leon in Athens, Georgia; to Gretchen in Buffalo, New York; and to Patrick and Elsie in Nashville, Tennessee. DL, John, and Gretchen get their copies over the Internet, and Patrick and Elsie get theirs through CompuServe, but any of us can send a message to the list and all of us get it.

Aunt Jane, the leader of this project, isn't on the Net (yet), so we deliver her printed drafts, either in person or by paper mail. She wrote the 500+ page manuscript we started with, so she compares our current draft of the volume we're working on to her manuscript. She also adds new material she has found or has remembered personally; at 89 she is one of our most important primary sources, in addition to being the principal author. We pick up her annotated copy or she mails it to one of us, and we transcribe her editing marks. If she has put in questions for one of us who is online, we often send the question to the list so all of us can discuss it.

About every month or so, two or more of us get together in one place and discuss the project, among other things. The location varies, sometimes in Athens or Nashville, occasionally in Austin, often at the family farm near Valdosta, Georgia, or just about anywhere else, from Atlanta to Oxford. Elsie and Jane's brother David, who is DL, Patrick, and John's father, grumbles

continued on page 94

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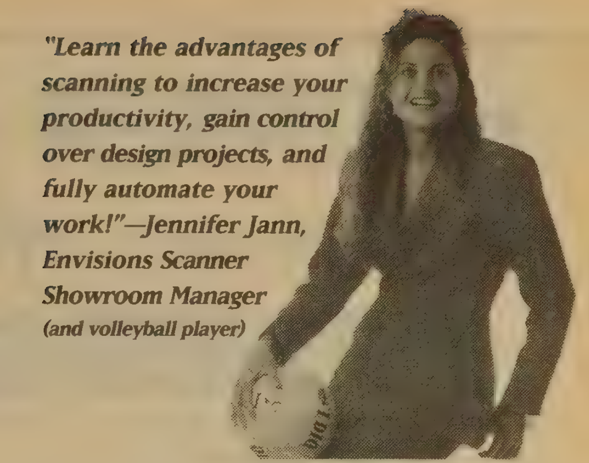

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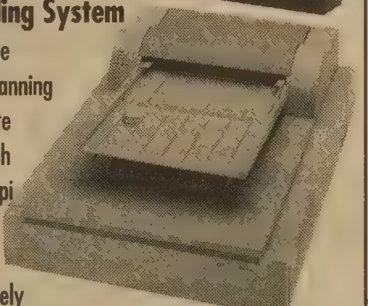

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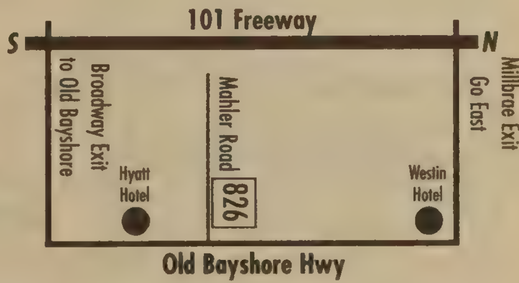

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- ▲ **700MB** IDE Western Digital Hard Drive
- ▲ **Fujitsu** 101 Enhanced Keyboard
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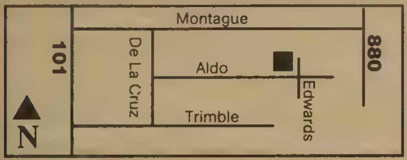

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about this project, since he's had to put up with it in one form or another for seventy years, but we don't let him off the hook, either. We deliver him drafts of the Quarterman family history book and transcribe his comments and his stories. He, like Jane and Elsie, is also a primary source, and it's interesting seeing where their stories match.

We use the telephone, too. We don't limit our communications to online media, but we do find those media to be of powerful benefit.

We also use our mailing list to inform each other of contacts and events. Our minister cousin Helen read a newspaper article about a man who seemed very likely to be a relative. She sent the article to her brother Clark in Valdosta, who showed it to John. John got the likely relative's telephone number from directory assistance and called it. His wife confirmed that he was indeed a relative, and had information on a whole branch of the family we had misplaced. He even has photographs, and he will send us copies.

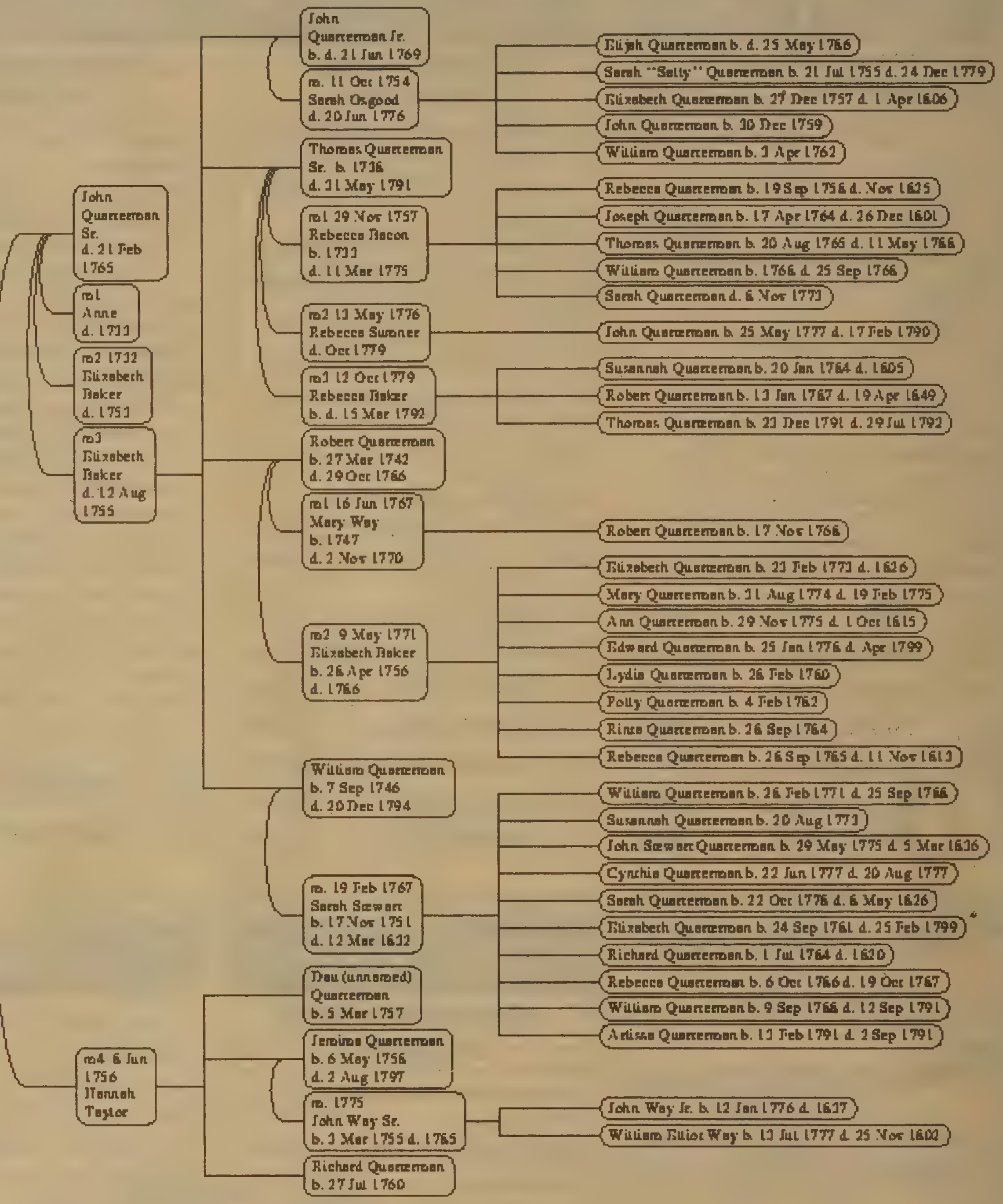
Patrick's Photoshop

Patrick handles the photographs. He scans them on his flatbed scanner and uses Adobe Photoshop to adjust contrast, remove tears, and generally make them more presentable and get the most out of the available information. Jane has quite a collection of old photographs, from tintypes onwards. They are in varying states of preservation, since they passed through various hands at various times. Patrick has even managed to digitally stitch back together a newspaper photograph that was torn in half, and also to disguise the halftones so that it now looks like an actual photograph.

Patrick then encodes the results of all this photographic finessing in either TIFF or Encapsulated PostScript (EPS), or often both, and sends them to DL or John for inclusion in the book. This step is a bit tricky, since Patrick doesn't yet have Internet access for ftp and CompuServe charges a noticeable fee for mailing large messages; even compressed these pictures are pretty big. Sometimes he calls up one of our machines after the telephone rates drop and transfers the files with Kermit. More often he zips them onto a series of floppies and sends them by UPS.

Once we get the pictures, we unzip them into a directory on the machine that holds the master copy of the book. It's an i486 machine running BSDI that is usually located in Athens. It's been known to take a side trip to Austin, but it's usually on the Internet in either location. Because it's on the Internet, either DL or John can log in on it by telnet and edit text files or the genealogical database, and format the book, from title page (*Families Helped Build America: The Quarterman Family of Liberty County Georgia and Allied Families*) to index.

Descendants of Two Generations of John Quarterman Sr. (South Carolina - 1765)



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m1 Anne d. 1733
m2 1733 Elizabeth Baker d. 1753
m3 Elizabeth Baker d. 12 Aug 1755
m4 6 Jun 1756 Hannah Taylor
John Quarterman Jr. b. d. 21 Jun 1769
m. 11 Oct 1754 Sarah Osgood d. 20 Jun 1776
Elijah Quarterman b. d. 25 May 1788
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John Quarterman b. 30 Dec 1759
William Quarterman b. 3 Apr 1762
Thomas Quarterman Sr. b. 1736 d. 31 May 1791
m1 29 Nov 1757 Rebecca Bacon b. 1733 d. 11 Mar 1775
Rebecca Quarterman b. 19 Sep 1758 d. Nov 1825
Joseph Quarterman b. 17 Apr 1764 d. 26 Dec 1801
Thomas Quarterman b. 20 Aug 1765 d. 11 May 1788
William Quarterman b. 1768 d. 25 Sep 1768
Sarah Quarterman d. 6 Nov 1773
m2 13 May 1776 Rebecca Sumner d. Oct 1779
John Quarterman b. 25 May 1777 d. 17 Feb 1790
m3 12 Oct 1779 Rebecca Baker b. d. 15 Mar 1792
Susannah Quarterman b. 20 Jan 1784 d. 1805
Robert Quarterman b. 13 Jan 1787 d. 19 Apr 1849
Thomas Quarterman b. 23 Dec 1791 d. 29 Jul 1792
Robert Quarterman b. 27 Mar 1742 d. 29 Oct 1788
m1 16 Jun 1767 Mary Way b. 1747 d. 2 Nov 1770
Robert Quarterman b. 17 Nov 1768
m2 9 May 1771 Elizabeth Baker b. 26 Apr 1756 d. 1788
Elizabeth Quarterman b. 23 Feb 1773 d. 1826
Mary Quarterman b. 31 Aug 1774 d. 19 Feb 1775
Ann Quarterman b. 29 Nov 1775 d. 1 Oct 1815
Edward Quarterman b. 25 Jan 1778 d. Apr 1799
Lydia Quarterman b. 26 Feb 1780
Polly Quarterman b. 4 Feb 1782
Rinza Quarterman b. 26 Sep 1784
Rebecca Quarterman b. 26 Sep 1785 d. 11 Nov 1813
William Quarterman b. 7 Sep 1746 d. 20 Dec 1794
m. 19 Feb 1767 Sarah Stewart b. 17 Nov 1751 d. 12 Mar 1833
William Quarterman b. 26 Feb 1771 d. 25 Sep 1788
Susannah Quarterman b. 20 Aug 1773
John Stewart Quarterman b. 29 May 1775 d. 5 Mar 1836
Cynthia Quarterman b. 22 Jun 1777 d. 20 Aug 1777
Sarah Quarterman b. 22 Oct 1778 d. 6 May 1826
Elizabeth Quarterman b. 24 Sep 1781 d. 25 Feb 1799
Richard Quarterman b. 1 Jul 1784 d. 1820
Rebecca Quarterman b. 6 Oct 1786 d. 19 Oct 1787
William Quarterman b. 9 Sep 1788 d. 12 Sep 1791
Arissa Quarterman b. 13 Feb 1791 d. 2 Sep 1791
Dau (unnamed) Quarterman b. 5 Mar 1757
Jemima Quarterman b. 6 May 1758 d. 2 Aug 1797
m. 1775 John Way Sr. b. 3 Mar 1755 d. 1785
John Way Jr. b. 12 Jan 1776 d. 1837
William Eliot Way b. 13 Jul 1777 d. 25 Nov 1802
Richard Quarterman b. 27 Jul 1760

jsr.ps 9/99; Thu Dec 1 13:16:37 1994 [gif]

Genealogical Databases And The Joys Of Transferring Large Files

The genealogical database is maintained with a program called LifeLines, which was written by Tom Whetmore. There's a mailing list about LifeLines, and we get the latest version of the program by ftp across the Internet. We use LifeLines to generate much of the source text of the book directly out of the genealogical database, and to generate hooks to include other text pieces, pictures, and genealogical charts. We format the book with LaTeX and TeX, producing PostScript output. The EPS version of the pictures is incorporated directly into the output PostScript, so the whole book can be printed as a single large PostScript file.

John and DL routinely transfer copies of the output PostScript book across the Internet between their machines; it's about 8MB compressed. Since the com-

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Family History On The Net *continued...*

puter with the database is usually in Athens, John often reformats the book through telnet to that machine, ftps the output to Austin (or Buffalo, or wherever he happens to be on the Internet at the moment), and uses a PostScript previewer such as Pageview, Ghostscript, or Ghostview to look at the results. This is quite convenient; we like to think of it as resource sharing as it was originally intended.

We've even indulged in a bit of distributed software development related to this project. DL and John have provided a few comments to Tom Whetmore in his development of the LifeLines program, as have many other people across the Matrix. Tom sometimes mails copies of the software, but most of us now pick it up by ftp. LifeLines users not only contribute directly to the development of the main database program. They also write report generator programs that work with LifeLines itself to generate reports ranging from lists of birthdate frequencies to tiny tafels (lists of surnames and dates that show when those surnames are of interest for a particular genealogical research project) to genealogical chart-drawing programs to the kind of report generator we use to produce the TeX source for the book.

Internet access is not just faster than mail-only access to the rest of the Matrix, Internet access is qualitatively different in large, clear, and important ways.

We have written a report generator that draws descendant charts (see http://www.tic.com/~jsq/chart/) in a manner that we like. We tested this program on several different computer platforms across the Internet, using ftp to deliver it and telnet to run it.

Patrick, however, is still too far out on a limb of the worldwide Matrix of computer networks that exchange electronic mail to participate in this level of resource sharing. It would be very useful if he could see the formatted book online without waiting for DL to print a copy and mail it to him, especially considering that at seven hundred pages printing the whole thing has become nontrivial. But CompuServe doesn't permit telnet or ftp. We could uuencode the book into a large number of mail messages and send it to him that way, but he wouldn't like to pay the resulting CompuServe bill.

We can use LifeLines to write the genealogical database in GEDCOM format and send that to Patrick. That's much smaller than the formatted book, and GEDCOM is the genealogical information exchange format universally used by all modern programs of this type; according to its documentation it is "the GEnealogical Data COMmunication standard proposed by the Family History Department of The Church of Jesus Christ of Latter-day Saints, and adopted by many developers and users of genealogical software."

So Patrick can then examine the database, perhaps using The Master Genealogist (TMG) or Brother's Keeper or some other

continued on page 311

Powerful 486 Notebooks . . . .

Texas Instruments TravelMate 4000M/E Computer

TI TravelMate 4000M Color

486DX2/50 Active Color, VGA 640X480,4MB RAM exp. to 20MB 1.44 FD, 455MB HD, DOS6 Windows 3.1,Quick Port Mouse

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$BEST

486SX2/50 Active Color, VGA 640X480,4MB RAM exp. to 20MB 1.44Floppy drive, 340MB HD,DOS6 Windows 3.1,Quick Port Mouse

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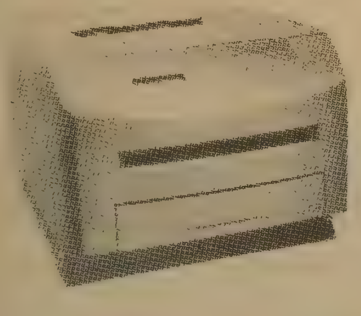

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- Mac and PC

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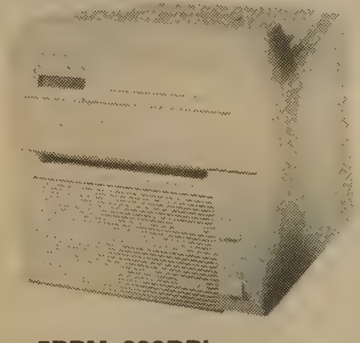

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- PostScript 2 & PCL5
- Mac & PC

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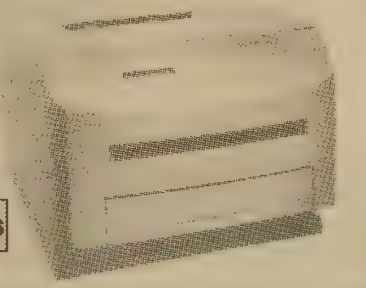

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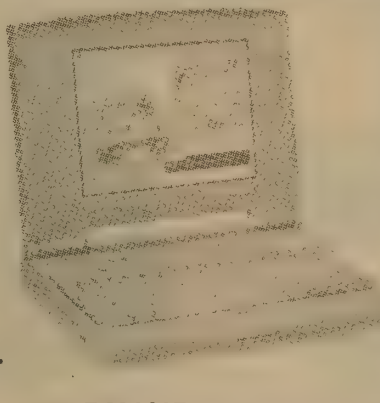

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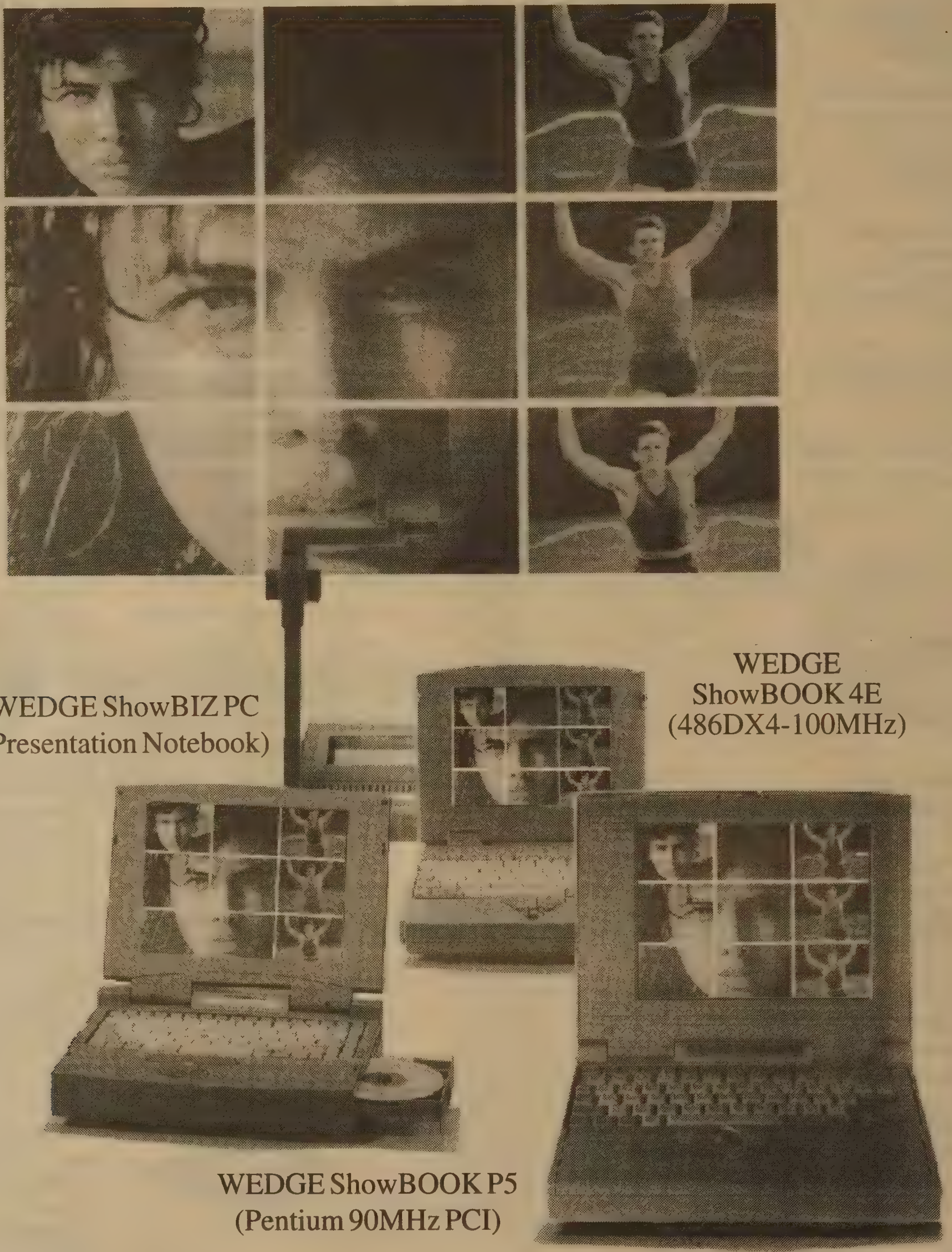

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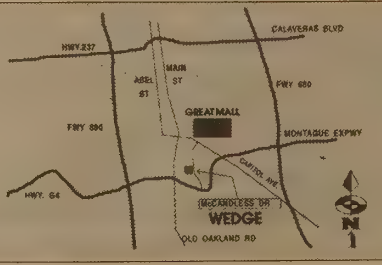
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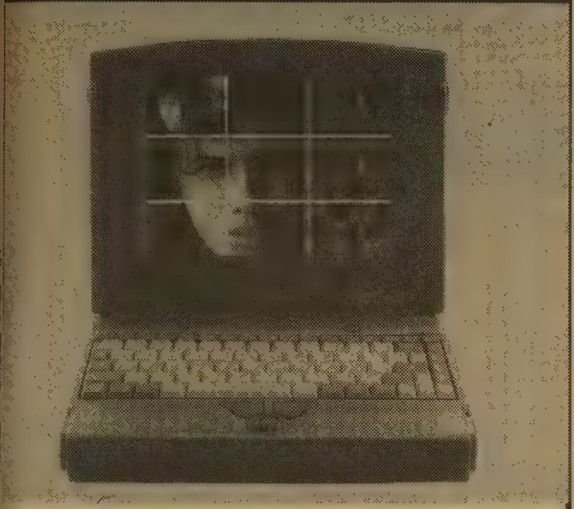

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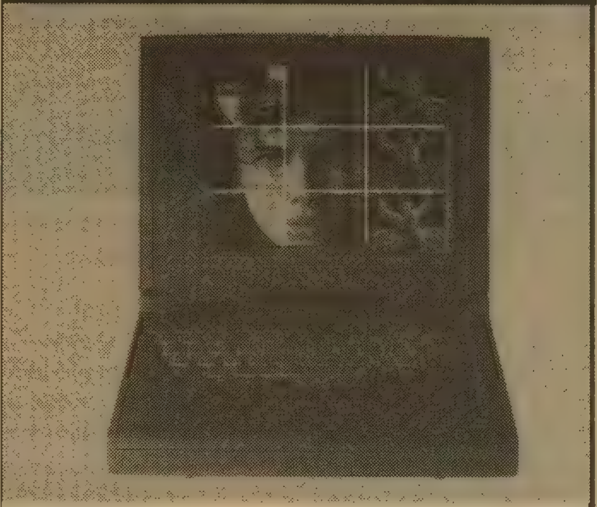

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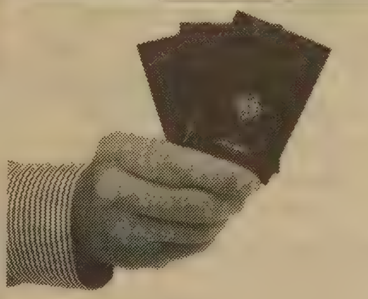

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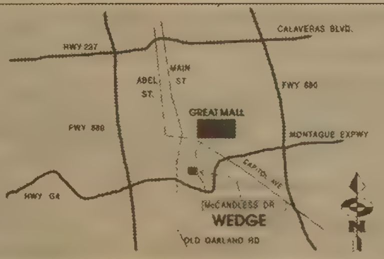

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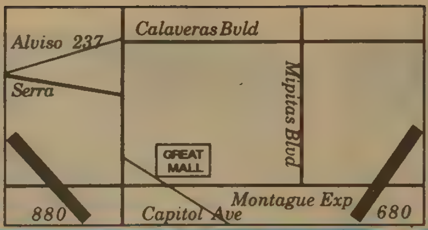

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420mb/13ms (IDE)	200
540mb/12ms (IDE)	230
730mb/10ms (IDE)	305
1.0 GB/10ms (IDE)	455

CONTROLLER CARDS

IDE W/ I/O	14
I/O with 2s/1p/1g	12
IDE VESA Local Bus	20
IDE VESA Local Bus w/16550	40
PCI IDE/PCI SCSI-2 Controller	38/119
Promise IDE DC 200/4030VL	99/113
Promise 4020VL	103
Adaptec SCSI 1522	72
Adaptec SCSI 1542CF/1542CF w/Kit	168/239
Adaptec EISA SCSI 2742T/2742T w/Kit	225/350
Adaptec SCSI PCI 2940 w/Kit OEM/ 2940W	200/270
Adaptec SCSI 2842A-VL OEM	210
SPiDER Pro 32 VLB IDE w/I/O and SVGA Video	94

MISCELLANEOUS

❖ZOLTRIX	
Fax Modem (96 F, 24 M)/Win	$39
Fax Modem (14400 F, 14400 M)	60
Fax Modem (28,800 Baud)	113
❖ US Robotics Fax/Modem 14,400	100
❖ US Robotics Fax/Modem 28,800 v.34	230
❖ Microsoft mouse serial/bus	26/53
❖ Logitech Mouseman serial/Bus (4000dpi)	30/51
❖COLORADO	
Tape backup DJ-20 250MB/DJ-35C 340MB	153/175
Trakker 250MB/Trakker 680MB	295/475
❖ Baby AT/Mini Tower case w/230W PS	40
❖ Medium Tower case w/230W PS	61
❖ Full Tower case w/250W PS	80
❖ Dual Floppy Drive 1.2+1.4MB	99
❖ TEAC 1.2FD/1.44FD	42/38

VIDEO CARDS

❖TRIDENT	
SVGA-512/1MB (1024x768,16bit)	$38/58
❖DIAMOND	
Stealth 24 VLB w/1MB DRAM	129
Viper SE PCI w/2MB	255
Stealth 64 VLB/PCI w/1MB/2MB DRAM	135/185
Stealth 64 VLB/PCI w/2MB/4MB	280/420
❖SPIDER	
Tarantula PCI w/2MB/4MB	245/360
32VESA Local Bus w/1MB/2MB	83/133
32VLB Plus w/1MB/2MB	92/140
BlackWidow Engine ISA 1M/2M	125/175
BlackWidow+ PCI/VLB w/1MB/2MB	150/210
256 Cache VLB w/1MB/2MB	100/150
64 VLB/PCI w1MB/2MB/4MB	112/167/277
Pro VLB SVGA VIDEO w/IDE/I/O	94
❖ORCHID	
Kelvin VLB/PCI w/1MB/2MB DRAM	138/177
Kelvin Easy VLB/PCI w/ 1MB	105
Fahrenheit PRO VLB/PCI 2M/4M VRAM	275/405
❖ATI	
ATI Ultra Pro Mach 32 VLB/PCI w/2MB	160/220
ATI Mach64 Pro Turbo VLB/PCI w/2MB/4MB VRAM	270/470

MONITORS

❖NANAO	
F550iw/340iw	$860/585
F560iw17"/T560i 17"	1140/1360
F760iw 21"/T660i 21"	1800/1930
❖NEC	
3FGE/4FGE/5FGE	505/600/940
❖MAG	
MX15F/MX17F	420/775
DX15F/DX17F (1280x1024,0.26)	345/615
❖SONY	
GDM 20SE/ 17SF / 15SF	1,780/ 825 / 420
❖HITACHI	
CM-2095 20"	1,165
CM-2198 21"	1,835
CM-1586MV	389
ACUVUE GX20/GX21	1470/1790
❖VIEWSONIC	
6 E	254
15/15G	399/375
17/17G/17E	820/715/685
20/21	1,380/1,599
❖MINI MICRO	
Interlaced (1024x768) Monitor 0.28	205
Non-interlaced Monitor 0.28	215
❖IMPRESSION	
GREEN 15"	310

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486 Computer System w/256K

- 8MB RAM
- Teac 1.44MB 3.5" Floppy Drive
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- 14" SVGA Monitor .28dp NI
- Local Bus Video Card w/1MB
- 101 Keyboard
- Mini Tower Case
- MS-DOS 6.22
- Serial Mouse w/Pad
- Double Speeed CD ROM Drive
- 16 Bit Sound Card
- Stereo Speakers w/15 Titles

DX-33 $1450

DX2-66 $1545

386 Computer System

- 4MB RAM
- 1.2MB & 1.44MB Floppy Drives
- 2 Serial, 1 Parallel, 1 Game Port
- 101 Keyboard
- 200MB IDE Hard Drive
- SVGA Card
- 14" SVGA Monitor
- Mini-Tower or Desktop Case
- MS-DOS 6.22

DX-40 $900

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Trident SVGA w/1MB	$65
C-Logic VLB SVGA w/1MB	$90
NCL 538 Controller	$50
NCL 539 Controller	$50
SMC Combo Ethernet Card	$119

CASES AND POWER SUPPLY

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Baby Tower w/250 Power	$65
Mid Tower w/250 Power	$90
Full Tower w/280 Power	$160
250W Power Supply	$50
200W Power Supply	$50
230W Power Supply	$50

PRINTERS

Citizen 190GX (9 Pin)	$175
Citizen GSX230 (24 Pin)	$239
Citizen GSX240 (24 Pin)	$299
Citizen Color Upgrade Kit	$49
Toner KX-P450	$37
Toner KX-P453	$35.95
Toner KX-P451	$39.95
HP 51604A	$11.95
HP 51626A	$25.95
HP 92261A	$11.95
HP 92274A	$59.95
HP 92275A	$63.95
HP 92295A	$77.95
HP 92298A	$99.95

MODEMS

Mitac 2400/9600 Int. Fax Modem	$50
Mitac 14,400 External Modem	$149
US ROBOTIC 14,400 Int. Fax Modem	$109
US ROBOTIC 14,400 Ext. Fax Modem	$129
US ROBOTIC 14,400 Int. Modem	$110
US ROBOTIC 14,400 Ext. Modem	$149

CD-ROM

Bundle Specials!

Panasonic 562 AT BUS
- Sound Blaster Pro Deluxe
- Kings Quest
- Mother Goose
- Family Choice
- Dictionary of the Living World
- Speakers

$330

Sony CDU33A
- Sound Blaster 16 Multi CD
- Battle Chess
- Mother Goose
- US Atlas & Automap
- Mavis Beacon Teaches Typing
- Speakers

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Double Speed Int. CD ROM Drive	$135
Sound Blaster Pro Deluxe	$89.95
Sound Blaster 16 Basic	$119
Sound Blaster Multi CD	$149
Sound Blaster 16 SCSI-2	$179
MIDI Kit	$49

KEYBOARDS

Mitsumi 101 Keyboard	$35
Chicony KB5311 Keyboard	$26
Chicony KB5181 Click Keyboard	$40
Focus 2001 Click Keyboard	$45
Keytronic Keyboard	$40

MEMORY CHIPS

DRAM	
256K-8/10	$1.25
256Kx4-8	$5.50
64K-10	$1
SIMM	
4MB x9-7	CALL
1MBx9-7/8	CALL
1MBx3-7/8	CALL
1MBx36-7	CALL
2MBx36-7	CALL
4MBx36-7	CALL

MONITORS

14" Monochrome	$95
14" SVGA Monitor 1024x768 .28dp	$230
14" SVGA Monitor 1024x768 .39dp	$200
14" SVGA Monitor 1024x768 .28dp NI	$250
15" SVGA Monitor 1280x1024 .28dp NI	$339/359
17" SVGA Monitor 1280x1024 .28dp NI	$CALL

MOTHERBOARDS

386DX-40MHz MB w/128K	$110
486DX-33MHz VESA w/128K	$Call
486DX2-66MHz VESA w/256K	$Call
586 Pentium 60MHz PCI w/256K	$Call
586 Pentium 66MHz PCI w/256K	$Call
586 Pentium 90MHz PCI w/256K	$Call

DRIVES

CONNER	
CFS 210A 213MB IDE	$169
CFS 420A 420MB IDE	$209
CFA 540A 540MB IDE	$259
CFP 1060S 1.06GB SCSI	$579
MAXTOR	
MXT 7290 290MB IDE	$185
MXT 7345 345MB IDE	$199
MXT 7456 540MB IDE	$259
SEAGATE	
ST 3243 214MB IDE	$169
ST 3491A 428MB IDE	$219
TEAC	
1.2MB 5.25"	$50
1.44MB 3.5"	$42

TAPE BACKUP

Colorado 120MB/250MB	$115/165
External Kit for Colorado Drive	$110
Colorado Jumbo Trakker 250 MB	$299

MOUSES

Trackball	$69
Logitech Serial Mouseman	$49.95
Microsoft Bus Mouse	$89
Microsoft Serial Mouse	$40
DEXXA Mouse	$25
Mouse Systems A3 Mouse for Mac	$50
Mouse Systems A3 Trackball for Mac	$50

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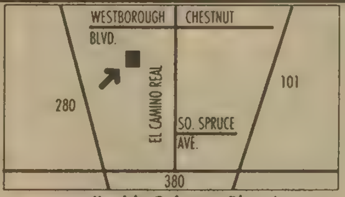

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Trident 8900C/D 1 MB
14" SVGA .28 NI Monitor
Double Speed CD-ROM IDE
SoundBlaster C Card
Speakers, Microphone
JoyStick
Educational 1 CD Bundle
KeyBoard, Mouse
MS DOS 6.21, WIN 3.11

$1,077

THE ROADRUNNER PCs Value, Performance, Compatibility

System Pricing		BareBone:	Complete Systems					
TYPE OF SYSTEM	BUS Structure	Motherboard Mini-Tower Case IDE w/2SPG 1.44 FDD 101 K/B Serial Mouse	BareBone + 1 MB RAM SCSI 40MB HDD 14" Mono MGP Card	BareBone + 4 MB RAM IDE 170 MB 14" Mono SVGA SVGA 512K Card	BareBone + 4 MB RAM IDE 270 MB HDD 14" SVGA .39 SVGA 1MB Card	BareBone + 8 MB RAM IDE 420 MB HDD 14" SVGA .28 SVGA 1MB Card +1.2 Floppy	BareBone + 8 MB RAM IDE 540 MB HDD 14" SVGA .28 NI SVGA 1MB Card +1.2 Floppy	BareBone + 8 MB RAM IDE 730 MB HDD 15" UVGA .28 NI SVGA 1MB Card +1.2 Floppy
PentiumI* 90 w/256K	PCI, ISA	$1,004					$1,865	$2,005
PentiumSS* 90 w/256	PCI, ISA	$907					$1,767	$1,908
PentiumSS* 60 w/256k	PCI, ISA	$672				$1,492	$1,532	$1,672
Nx586-90 w/256K	VLB	$800				$1,594	$1,634	$1,774
486DX4-100 w/256	VLB	$517			$1,073	$1,311	$1,351	$1,491
A486DX2-80 w/256K	VLB	$397			$953	$1,191	$1,231	
C486DX2-66 w/256K	VLB	$341		$726	$891	$1,124	$1,164	
C486DX2-50 w/256K	VLB	$289		$674	$839	$1,072		
I486SLC2-66 w/64K	ISA,VLB	$249	$476	$637	$803			
A386DX-40 w/128K	ISA	$190	$417	$578	$729			
A386SX-40	ISA	$156	$384	$545				

PCI Systems include PCI IDE Controller and CL5434 1MB PCI Graphic Card

VLB Systems include VLB IDE Controller and Cirrus Logic 5428 1MB VLB Graphic Card

CPUs: A - AMD; C - Cyrix; I - IBM; I - Intel; Nx - NexGen

* Intel Pentium CPU based Systems

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CL5428 1 MB VLB
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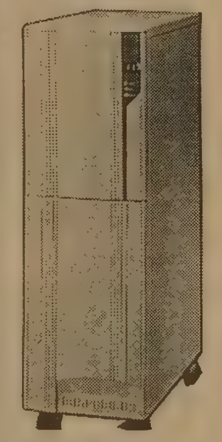
SoundBlaster 16 MCD
LabTec Speakers
KeyTronic K/B
LogiTech Mouse
MS DOS 6.21, WIN 3.11

$1,546

The Thoroughbred Workstations



Hardware platform for Multiple Operating Systems... and Applications demanding Workstation Power... AutoCad, P-CAD, Windows NT

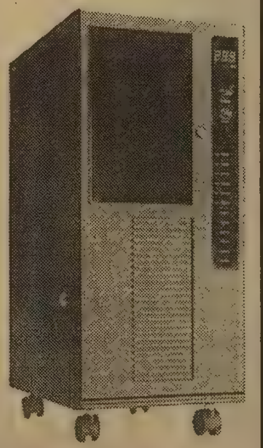
ASA... ...Proven Systems for all Applications

The THOROUGHBRED Workstations - Top-of-the-Line - Power, Functionality, Price

ARCHITECTURE	UMC(cs) - AMD	UMC(cs) - Intel	Intel(cs) - Intel	Intel(cs) - Intel	Intel(cs) - Intel	MIPS*
Motherboard	MustangS	MustangS	CapricornI	CapricornNx	CapricornI	SH-RISC
CPU	Intel 486DX2-66	AMD 486DX4-100	Intel Pentium 60 Mhz	NxGen 586 90 Mhz	Intel Pentium 90 Mhz	MIPS R4450 - 150
CPU Power Est. (Mips)	21	42	42	~60	60	75
Architecture, Cache	VLB, ISA; 256K	VLB, ISA; 256K	PCI, ISA; 256K	VLB, ISA; 256K	PCI, ISA; 256K	EISA, ISA; 512K
RAM	16MB - 64MB	16MB - 64MB	16MB - 128MB	16MB - 128MB	16MB - 128MB	16MB - 256MB
Hard Drive	540 IDE Quan MV	540 IDE Quan MV	540 IDE Quan MV	WD 730MB IDE HDD	WD 1 GB IDE HDD	1.08GB 9.5ms SCSI-II
Drive Controller	WS IDE	WS IDE	PCI IDE Built-In	VLB IDE	PCI IDE Built-In	32 Bit SCSI-2 Built-in
I/O	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P
Video Card	S3-805 VLB	S3-805 VLB	S3-864 PCI	S3-805 VLB	S3-864 PCI	GUI S3 1MB - 2MB
Monitor	15" .28 1280x1024NI	15" .28 1280x1024NI	15" .28 1280x1024NI	17" .26 1280x1024NI	17" .26 1280x1024NI	17" .26 1280x1024NI
Operating System	MS DOS, WIN 3.1	MS DOS, WIN 3.1	MS DOS, WIN 3.1	MS DOS, WIN 3.1	MS DOS, WIN 3.1	MS DOS, WIN 3.1
Case	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS
Price	$1,863	$2,000	$2,237	$2,689	$3,068	$4,121

WorkStations Include: 1.2 and 1.44 MB Floppy Drives, KeyTronic KeyBoard, Logitech Serial Mouse
*Please ask for list of ported Applications

The Thoroughbred Servers



Outstanding Price Performance and Functionality for Application and Networking Servers

MOTHERBOARDS & CONTROLLERS

ISA/EISA MOTHERBOARDS

286-12/20	**$20/43**
386SX-40	**$57**

THE STALLION SERIES

ISA 386DX-40 w/64,128k	**$90**
ISA 486SX-25	**$96**
486DLC-40 w/128K	**$113**
ISA 486SX33 128K	**$167**
ISA 486DX-33 256k C/AMD/Intel	**$183/222/199**
ISA 486DX-40 256k Cyrix/AMD	**$184/235**
ISA 486DX-50 256K Cyrix/Intel	**$333/372**
ISA486DX2-50 256k C/AMD/Intel	**$173/244/244**
ISA 486DX2-66 w/256k AMD/Intel	**$250/263**
EISA 486DX-50 Intel/Cyrix w/256k	**$507/468**

VLB/PCI MOTHERBOARDS

486/P24T

MustangF 486SX-25 ISA/VESA	**$152**
MstngB 486DX-40 W/256K Cyrix	**$195**
MstngO 486DX-33 256C/AMD/Intel	**$202/241/213**
MustangO 486DX-40 256K Cyx/AMD	**$199/249**
MustangO 486DX-50 256k Cyx/Intel	**$341/347**
MustangO 486DX2-50w/256K ……Cyrix/AMD/Intel	**$188/258/258**
MustangO486DX2-66 256K AMD/Intel	**$265/277**
MustangO 486 256k AMD DX2-80	**$300**
IBM Alaris 486SLC2-66 w/Math-Co	**$143**
IBM BlueLightng BL3-75 w/M-Co	**$208**
MicronixJX30 486-33/50/66 Intel	**$372/546/436**
AMI SVoyager 486-33/50/66 Intel	**$456/630/520**
MustangO PCI/VLB w/256k Intel 486-66	**$304**
Pegasus NSuper 486-33/66 E/Vesa	**$415/520**
Micronix 486-33/50/66 Eisa/Vesa	$669/843/733
AMI*Ent IV 486-33/50/66 Eisa/Vesa	$568/742/632

Intel PENTIUM and DX-4

MustangO486DX4-100 Int/AMD 256K	**$554/424**
CapricornSS 256k PCI 60/66MHz	**$590/650**
CapricornSS 256K PCI 90MHz	**$835**
Capricorn I 256K PCI/ISA 60w/ide-io	**$676**
Capricorn I 256k PCI/ISA 90 w/ide-io	**$936**
CapricornS 512K PCI/VLB 60/66	**$679/740**
CapricornS 512k PCI/VLB 90Mhz	**$902**
Pegasus A PCI/EISA 256K 60/66 Mhz	**$860/965**
PegasusAD Dual PCI/EISA 256K 90	**$1384**
Capricorn NxNexGen 586-90 VLB w/256k	**$717**

ISA/EISA CONTROLLERS

IDE/MFM/RLL & FAST I/Os

Mustang IDE 2FD-2HD/4FD-2HD	**$14/28**
Mustang IDE w/ 2SPG	**$15**
Promise IDE Caching DC200 2FD/4HD	**$97**
FAST-PIG IDE,IO/IO w/16C550 Uarts	**$33/27**
ULTRA-IO 4S/2P 4 16C550 Bi-Dir	**$90**

SCSI

Future Domain Compatible16 bit	**$45**
Trantor SCSI Adapter T-130	**$51**
ADAP 1522 16BIT Card/Kit	**$78/137**
ADAP 1542C Card/Kit	**$201/249**
ADAP 1542C+ Kit (w/Corel SCSI)	**$317**
ADAP 1742 EISA	**$354**
ADAP 2742 EISA Fast SCSI2 C/K	**$304/354**
Bus Logic BT 742 Card	**$276**
Bus Logic BT747S Card/Kit 747S	**$291/329**
Bus Logic BT 757 Wide S card/kit	**$363**
DTC3290AS 7HD&4FD Caching	$380
AMI EISA SCSI II Caching wo/w pwrpk	$373/410
DPT Smart Cache3 EISA SCSI	$331
Mylex DCE EISA SCSI Caching Ctlr**	$228
Trantor348 Parallel Port to SCSI	$149

VLB/PCI CONTROLLERS

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MustangW 2008 2HD/4FD/2S/1P/2.88	**$43**
MustangW 2018 2HD/4FD……/2S(16550)/1P 2.88	**$48**
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DTC 2278 IDE/IO	$29
Promise DC-4030 4HD/2FD Caching	**$109**

SCSI

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Medium Tower w/PS Compact/Regular	$47/58
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Regular/Spill-Resistant 101	$14/16
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Japanese Keyboard, 106 Keys	$57
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Also line of European/Arabic KBs

S-Mouse/TBall	$8/20
LogiTech Ser/Bus bulk	$17/34
LogiTech Mouseman Cordless	$82
Microsoft white box S/B	$29/54
BLACK SERIAL	**$14**

POWER SUPPLIES

PS2 200/230/300W	$34/40/51
PS2 230/250W GREEN PC	**$44/52**
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MASS STORAGE PRODUCTS

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YE Data 1.2/1.44MB	**$41/32**
Teac 1.2/1.44MB	**$46/35**
Teac Dual Floppy 1.2 + 1.44 MB	**$91**

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IDE

(Hard drive prices change often-please call!)

Dae Young 120 (30 days warranty)	**$104**
CON 170 MB 17 msec	**$129**
CON 210 14msec	**$148**
MXTR 270MB 15msec	**$151**
WD 340/MXT 340MB 12/14 ms	**$179/$165**
MXTR 420 AV	**$187**
CON 420MB	**$179**
WD 425MB 13msec	**$189**
QTM 540 MV/LTS	**$208/228**
WD 540 12msec	**$239**
MXTR 540 8,5/12 msec	**$238/224**
WD 730/850 12msec	**$308/330**
CON 850	**$325**
WD 1.0 GB	**$448**
MICROPOLIS 1/1.8GB 10ms	$589/925

SCSI - 3.5"

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CON 212MB 12 msec	$202
MXTR 213	$202
MXT 290/340MB 13 msec	$165/188
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MXT 540MB /CON 540 8/12 ms	**$312/319**
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QTM 1.4 GB 10msec 5 year	**$708**
DEC 1.07GB DSP3107 9ms	$657
DEC 1.6GB DSP3160 9ms	$886
Quantum 1.08 GB	**$545**
MICROPOLIS 1/1.8GB 10ms	$629/945
HP1.2GB 10.5msec	$679
ST1.2GB ST31200N 9 msec	**$535**
Quantum 2.1 GB	$889
ST12400N ST2.1GB 9MS	**$959**
DEC 2.1GB DSP3210 9ms	$1259
******ST 3.4GB ST43400N**	**$1599**
ST 15150N 4.2GB 8msec	$2219
ST 9GB ST410800N	$3402
Micropolis 9GB	$3199

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DEC 3.0GB DSP5300	$2046
DEC 3.5GB DSP 5350	$2312
DEC 4.0GB DSP 5400	$2488

SUPER HARD DRIVES

Seagate Barracuda 3.5" HH (8 msec ……avg. seek, 4.17 msec lat., 7200 RPM) 1.7/2.5/4.2 GB	$call/1136/2354

FLASH CARD HARD DRIVE

ST 75A 1.8" 5.2MB IDE<1.5MS	$484
ST 710/720A 1.8" 10.4/20.9MB	$888/1177
ST 740A 1.8" 41.9MB IDE<1.5ms	$2068

EXTERNAL HRD. DRV. SUBSYSTEM

FOR EXT. HARD DRIVE,………… ADD $99

TAPE DRIVES

(<500MB TAPE-BACKUPs)

Colorado 120 / 250MB	**$99/154**
Conner 250MB w/Cassette	**$144**
Conner 420 MB QIC Format	**$174**
Conner 850 MB QIC Format	**$279**
Colorado KE-10 External kit with card	**$129**
Colorado External port card	**$37**
FC-20 high perf card	**$85**
Colorado Trakker 250MB	**$294**
Archive Viper 250MB hh SCSI I/E	**$325/399**

(>500MB for PC / SERVER)

Viper 525MB hh SCSI Int/Ext 6MB/sec	$450/515
Mountain FS1200 4GB I/E	$1545/2175
Conner 4200 Int/Ext	$779/975
Conner-Python 4320 NT 2.0GB DAT 3.5"	$789
Conner-Python 4324RP 4.0GB DAT 3.5"	$846
Colorado 2.4 / 4.0 GB Qic 5.25	$859/975
HP 2GB 35470 DAT 4mm Int/Ext	$795/874
HP 4-8GB 35480 DAT 4mm Int/Ext	$895/989
HP 4-8GB DAT 1533A 4mm Int/Ext	$990/1100
WANGTEK 5100 1.0GB 4mm Int/Ext	$639/769
WANGTEK 3100/3200 2/4GB 4mm Int	$879/985
WANGTEK 3400 8-16GB 4mm Int	$1099
EXABYTE 4200/4200C 2/4GB	$779/859
EXABYTE 8205 5GB 8mm 5.25 I/E	$1245/1555
EXABYTE 8505 10GB 8mm Int/Ext	$1935/2265

(above drives require special contr & soft drivers)

TAPE BACKUP DRIVERS

Novaback for DOS//OS/2	$65
Novanet Multiuser NLM	$279
ARC Serve Single	$125
SYTOS for DOS/NOVELL, GEN	$120
Conner Backup Exec for Dos/Win v3.3	$79
Conner Backup Exec for Netware v3.1	$259

MAG/OPTICAL (Rewritable)

Ricoh 128MB 3.5" Internal	$532
HP 1.3GB 5.25" SCSI-2 EXT	$2450
MAXOPTIC 1GB Tahiti IIM 35msec	$2260

REMOVABLE DRIVES

Syquest 44MB Dr.	$249
……W/Ext Case, Cables, Cart, Cont	$379
Syquest 88/105MB Dr.	$308/389
Bernoulli 44/99 Insider	$789/840
IDE: Upto 1GB removable kits	$39
SCSI: Upto 1GB Removable Kits	$138

DISKETTES & CARTRIDGES

Floppy 1.44 Bulk 20+/100+/500+	**$.49/.39/.34**
Floppy 1.2 Bulk	**$.44**
Tape DC2120 250MB..Formatted	**$16**
Tape DC 6250 5.25", 1/4" Cartridge	$25
Tape DC 6525 5.25", 1/4" Cartridge	$30
TK50 for DECs	$24
DAT 4mm 90 mtr HP/OEM	$20/14
DAT 8mm 112 mtr.	$14
Syquest 44/88/105MB Cart	$62/94/85
Bernoulli 44MB/90MB 3Pk	$289/298/264
Mag-Opt 600MB/650MB 5.25" Rewrite	$86/86
Mag-Opt 1.2/1.3 GB Rewrite	$108/90
Mag-Opt 600/650MB WriteOnce	$76/76
Mag-Opt 1.2/1.3GB WriteOnce	$90/90
Mag-Opt 128/230MB 3.5"	$35/41
Mag-Opt 650/1.3GB WORM 5.25"	$144/144

VIDEO ADAPTERS & MONITORS

ISA/EISA ADAPTERS

MGP	$13
VGA 256k	$27
Trident 512K/1MB	$37/58
Tseng ET4000 1MB	$73
Mustang 1MB Window Accel	$58
ATI Ultra Grpx 1MB w/Mouse	$214
ATI Ultra 8514 1 MB VRAM(Dual mon. cap.)	**$176**
ATI Ultra Pro EISA 2MB	$294
AMI Fast View EISA VGA Graphics w/1MB	$221

VLB/PCI ADAPTERS

(wm = winmark ver2.5)

MustangVT Trident VLB 1/2MB	**$64/109**
MustangVC Cirrus logic VLB 5428 1/2	**$72/117**
MustangVS S3-805 VLB 1/2MB	**$69/114**
MustangET4000 VLB 1/2MB	**$88/138**
Spider 32 1/2MB,20 WM	**$82/127**
Spider 32 Plus 1MB	**$93**
Spider 64 1/2MB VLB/PCI	**$117/160**
Spider Black Widow+ 1/2MB PCI/VLB	**$160/221**
Spider Tarantula 2/4 MB	**$255/395**
DIAMOND Stealth 24VLB 1MB	**$132**
DIAMOND Stealth 64 1/2MB DRAM	**$137/169**
DIAMOND Stealth 64 1/2MB VRAM	**$277/440**
DIAMOND ViperSE 2MB VLB/PCI	**$255/294**
*ORCHID Celsius 1/2MB	$175/206
ORCHID Kelvin 1/2MB PCI/VLB	**$133/179**
ORCHID FAHRENHEIT64 1/2MB VL/P	**$165/216**
ORCHID FHAR PRO 2/4MB VL/PCI	**$322/479**
Hercules Dynamite Pro 1/2MBPCI/VLB	**172/225**
ATI Graphics Wonder 1MB DRAM PCI/VLB	$115
ATI Ultra Plus 2MB DRAM PCI/VLB	$171
ATI Graphics Exp. 2M B DRAM PCI/VLB	$210
ATI GraphicsProTurbo 2/4MB PCI/VLB	$288/499
Cirrus Logic 5434 PCI 1/2MB	**$95/145**
S3-864 PCI 1/2MB	**$95/145**
ET4000 PCI 1/2MB	**$104/154**

CAD SPECIALITY ADAPTERS

NUMBER NINE - #9GXI/GXE

L10 ISA or VLB Retail/Bulk	$249/236
L11 ISA or VLB Retail/Bulk	$359/339
L12ISA&VLBRetail/Bulk	$420/406
L14 ISA&VLB Retail/Bulk	$639/589
64 1MB/2MB....PCI or VLB	$175/249
64 PRO 2MB/4MB	$365/549

MATROX

MGA-VLB 2/Plus	$409/459
MGA-VLB 4/200	$845
MGA-IMP 3A&V	$699
MGA-PRO 4.5V/4.5+z buffer	$1095/1379
MB memory upgrade	$209
MGA-PCI 2/2Plus	$365/409
MGA-PCI 4/4-200	$616/768

METHEUS CORPORATION

Premier 928 VL2(1MB)/4(2MB)	$324/559
Premier 928 ISA 1M/2M/4M	$297/422/725
MODULE 1MB Memory	$119
1104 Plus 256 Hz, MultiDisplay	$1295

(We do not have the high end CAD adapters and monitors on display and carry only a few in stock - these are on Just-In-Time inventory basis - please place orders in advance-the prices in parenthesis are on a cash basis only)

14" MONITORS

MONO

Mono 14" amber/white	**$72**
Mono 14"/9" SVGA	**$90/120**

VGA/SVGA

SVGA 14" 1024 x 768 .39	**$185**
SVGA 14" 1024 x 768 .28 Int	**$207**
SVGA 14" 1024 x 768 .28 NI	**$215**
Black SVGA 1024 x .28 I/NI	$270/282
Kanaka 14" Int/NI w/Hitachi Tube	**$233/256**
CTX 14" 1024 x 768 .28 Int.	**$238**
CTX 14" 1024 x 768 .28 NI	**$244**

CAD MONITORS

Miscellaneous

KFC15".28 1280x1024NI wo/w Digital	**$285/350**
Mitac 15" .28 1280 LowRad,Energy*	**$305**
Orchestra Tube 17" 1600x .26	**$585**
KFC 17" .26 1280x1024 NI w/o digital	**$629**
KFC 17" .26 1280x w/digital display	**$685**
Mitac 17" .26 1600x NI Energy*	**$689**
Viewsonic 6E 14" .28 NI Green	**$262**
Viewsonic 15E 15" 1024x .28	$365
Viewsonic 15 .28 1280x MPR2	$425
Viewsonic 17" 1600x1280 .27	**$889**
Viewsonic 20/21	**$1525/1659**
MAGNVX20CM64 20", 1280, .31.($1110)	$1150

NANAO

T560i,.26 1280NI,MPR2	($1415)$1490
T660i 20",.30 1280NI MPR2	($1999) $2110
F760iw21".31,1280NI,MPR2	($1919) $2015

NSA-Hitachi

CM 1586 15" .28 1280x	$415
NS 1764 17" .28 NI 1280x	($795)825
CM1797 17`.28.1280NI,MPRII	($975)$1099
CM2095 20" 1280 Anti Glare	($1239) $1295
CM 2198 21" .28 1280NI	($1920)$1989

Hitachi America - ACCUVUE

PS-20,.31dpi 1600x NI	($1555)$1618
PS-21,.28dpi 1600xNI	($2029)$2099
PS-21A,.28dpi 1600xNI	($2149)$2259

Sony

15SF 15" 1280x .25	$445
1730 CPD	$908
GDM17SE 17" 1600NI .25	($955)$999
GDM20SE 20"	($1865)$1939

Nokia

17" 447B Trin.25dpi, 1280x	($927)$975
21"445M.26, 1280NI	($1955)$2029
21"445X.26, 1600NI	($2566)$2615

Sampo

Sampo KDM1767 17" .28	($668)$695
Sampo 1777 17" .28 Microp	($749)$785
Sampo 2055 20" .31	($1040)$1075
Sampo KDM2077 20" NI 1280 .31	($1460)$1520

NEC

2V 14" NI .28 1024x	$349
3V/4FGE	$485/($635)$659
5FGE/FGP17".28,	($999)$1045/($1125)$1165
6FGP21",.28,1280NI	($2005)$2095

MAG

MX15F 15"MPR II	($459)/$477
DX15F 15"	**$369**
DX 17F 17" .26 1280x	($645)/$669
MX17F,17".26,1280NI,Mic Org	($758)/$795

Prices given in bold are usual stock items, prices not in bold are special order items and require a 20% deposit, are not returnable, and take 2-3 days lead time.

CASH COUPONS

MONITORS
K F C 1 5 "
.28 1280 NI
$284

MONITORS
Orchestra Tuba
17" .26 1600
$579

COMMUNICATIONS
US ROBOTICS
14.4 F/M Int/Ext
5 YEAR/16550 UART
$89/109
(limited time, one per customer)

MOTHERBOARDS
MUSTANG O
C486DX2-66
VLB 256K CACHE
4MB RAM installed
$363

MOTHERBOARDS
CapricornNX
586-90 Mhz VLB
$689

MOTHERBOARDS
PENTIUM
CapricornSS series
60 Mhz PCI………$569
90 Mhz PCI………$799

ADAPTERS
CONTROLLERS
IO W/16550………$24
SCSI w/DRIVERS………$44
ADAPTEC VLB SCSI..$229
ADAPTEC PCI SCSI…$189

ADAPTERS
V L B / P C I
CL 5428 1MB………$69
HERCULES DYNA 1MB….$165
DIAMOND ST64 2MB….$159
S3C805/864 1MB……$69/89
ATI PCI 2MB………$229

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MULTI MEDIA

CD-ROMs

IDE TYPE CD-ROMs

SONY DOUBLE SPEED $113
Model # 55E

Panasonic 562 DblSpd.320ms, 300kb/sec.	$125

Super Multi-Media Complete Kit on Sale!
Mitsumi CD-ROM, 150KB/sec, 350ms
8 bit Sound Blaster Compatible Card (for Win)
Quickshot Warrior joystick
Shielded PC speakers
Deluxe model microphone
Award winning Apogee sound-supported games; all for.................$123!!!

SCSI CD-ROMs

NEC 3X 510CDR Ext 195ms,450KB/sec	**$339**
NEC 3XP Portable 250ms,450KB/sec	$460
NEC 4X Pro 16bit 180ms/600kb sec	$889

CD-ROM-#2-of-the-Month
NEC 3Xi
Multispin, 195ms,450KBS....$253

TOSHIBA 3401B/E 200ms, 300kb/s I/E	**$260/344**
TOSHIBA 3501Q Int. 120ms,600Kb/sec	**$300**
Plextor(texel) 3028/5028 240/335..I/E	**$255/339**
Plextor Quad speed bare OEM	**$322**
TEXEL Quad Panasonic Interface	**$249**
Mitsumi Quad IDE Interface	**$204**
NEC 210 CDR Int	**$146**
Future Domain Comp. SCSI CD-ROM Kit	$69

AUDIO CARDS & MPC KITS

Hyena Snd Blster Comp. 8bit Sound Card	**$39**
Hyena w/ Speaker, Joystck, mcrphn, game.	**$50**
Quickshot 16 w/ speakers,game,card etc	**$82**

MEDIA VISION

Pro Audio basic 16bit	$58
Pro Audio Studio 16/Power Pack	$125/59
Fusion Double CD16 Kit Int	$289
Pro 16 Multi-Media System1 SCSI /II	$649/449
Pro Movie Studio	$173

CREATIVE LABS

Sound Blaster Deluxe 8 bit	$79
Sound Blaster 16 Basic VE Retail	**$95**
SoundBlater MCD/w-asp OEM	**$77/121**
Sound Blaster SCSI/SCSI2 ASP Retail	**$139/202**
Sound Blaster 16 SCSI/ w/ASP OEM	**$113/157**
Discovery 16 kit	**$239**
Sound Blaster Voice Editor	$55
Wave/Video BlasterSE	$179/285

MISC MULTI-MEDIA PRODUCTS

Encyl 1:Encyl,Animals,World/US Atlas.	**$39**
Educational 1 plus Family health	**$68**
Joystick	**$15**
Logitech Fotoman Plus Digital Camera	$565
Logitech SoundMan 16 v1.1/Wave	$79/185
Video Logic Captivator Kit win3.1	$369
Midi Mate/CDPC XL	$49/1059

PLOTTERS, DIGITIZERS, SCANNERS & PRINTERS

PLOTTERS

HOUSTON INSTRUMENTS

V50 INKJET A-C,2MB BUFFER	$1298
HiPlot 7100 A-D 8 pen,LCD display	$2575
HiPlot 7200 A-E 8 pen,LCD display	$3395
DMP-162R A-E, 8 Pen, Roll Feed	$3958

DIGITIZERS

SUMMAGRAPHICS

III 12x12 w/16btn or 4bt & Pen	$312
III 12x18 w/16btn or 4bt & Pen	$539

KURTA

XLP 12x12 w/4btn & Pen	$225
XLP 12x18 w/16btn or 4btn & Pen	$429
XGT 12x12 w/4Btn	$322
XLC 36x48 w/16btn or 4btn&pen	$1520

CALCOMP

CALCOMP 12 X 12/12 x 18	$299/618
CALCOMP 18 X 24/24x36	$1275/1399

SCANNERS

LOGITECH (HAND-HELD)

SCANMAN-color Phototouch/OmniPg	$347/398
SCANMAN 256GS wo/ w OmniPage	$153/195
SCANMAN 32GS w/ OmniPage	$113
Scanman Power Page Slide	$404

MICROTEK

Scanmaker II/IIXE 1200/600dpi w/OCR	$521/899
Scanmaker IIHR 600dpi	$1055
Scanmaker IIG/IISP color cap 600dpi	$392/769

MUSTEK (Hand-held)

ScanMagic256, 400dpiw/perceive	$109
ScanMagic Color,400dpi,256 grays w/perc	$219
GrayArtist,800dpi,256 grays w/perc	$134
Colorartist Pro,800dpi,256&colr w/per	$249

MUSTEK (Flatbed)

Paragon 600(dpi)24 bitclr,Photoshop	$549
Paragon1200(dpi)24 bitclr,Photoshop	$839

UMAX Technologies

UC 630 PC,1200dpi max,24bit /256gray	$675
UC840,1600dpi max,16.8 million clrs	$889
UC1260,2400dpi max,16.8 million clrs	$1185
UC1200SE,2400dpi max.,30 bitclrs	$2550

Hewlett Packard

HP IICX Color scanner	$891

EPSON

ActionScanning 300/ES 1200C	$815/1296

Miscellaneous

Info 3gs 300dpi sheet fed	$375
Info SF-6C 600dpi sheet fed	$450
Relysis 9600 800dpi color flatbed	$2995
Tamarack 6000/8000C	$729/853

Fujitsu (Flatbed)

M3096E/G 11.7x17"400dpi 20ppm	$4222/4994

PRINTERS

Miscellaneous

Star Micrnix NX1001 9 Pin. 120/220V	$134/144
Star Micronix 220v quantity of 100 only	$135
IGOR 132 9Pin Wide 220V (Cyri..).in stock ......with any purchase	$110

EPSON

Action 2250 9 pin,50sheet,240cps	$115
LQ 2550	$903
LQ570+ 24 pin wide, 269 cps, 11 fonts	$249
LQ 1070+ 24 pin Wide,252cps,11fts	$369
LQ 1170 24Pin ,2 resident fonts	$609
Stylus 300 Inkjet 360dpi,150cps	$221
Stylus 800 Inkjet 360dpi,150cps,100sht	$283
ActionLaser 1500 300dpi,6ppm,1mb	$655
Actionlaser 1600 600dpi/Stylus color	$947/565
DFX-5000 9pin,wide, high spd. 533cps	$1485
DFX-8000 9pin, wide high spd1066cps	$2345

CANON

BJ200e/230,360dpi,49k,7fnts,4ppm	$255/395
BJ10SX,110cps,360dpi,**Portable**	$241
BJC 600 Color,240cps,360dpi,100shtfd	$499
BJC 820 Color,240cps,4ppm,1MB	$1467

OKIDATA

OL 380/321 dotmatrix,24Pin,23K	$217/420
OL400e/410elaser 4ppm, 300dpi	$489/635
OL810, 8ppm, 300dpi	$875
OL830 Plus/850, 8ppm w/ 2MB ps	$1055/1165
OKI ML520/521 9 pin 64K	$359/475
OKI ML590/591 24 pin..auto form	$417/561

PANASONIC

KX-P2124, N-Carr, 320cps, 360dpi, 12fnts	$318
KX-P2624/2023	$381/197
KX-P1624, W-Carr, 192cps, 360dpi, 14fnts	$383
KX-P 1150/2023	$149/199
KX-P4410,5ppm,300dpi,28fnts,512k	$529
KX-P4440/4430	$999/655

CITIZEN

GSX 145 24Pin wide,160cps,360dpi	$349
GSX200 9pin,Narr/wide	$168/289
GSX220 24pin/CTZ projectII 3ppm	$179/279
GSX230 24 pin.8 fonts, 270cps	$221
(color option for Citizen 80 col printers	*$45)*
GSX240 24 pin 300cps, 13 fonts	$281
Notebooks CTZPN48/CTZNP-IBM	$284/326

HEWLETT PACKARD

Deskjet 540 300dpi,120cps,16k	$289
Deskjet 560C Color,3ppm,300dpi,80k	$455
Deskjet 1200C/ps Color2MB	$1357/1837
HP 4+/4P/4SI/4L/4V	$1351/907/2835/619/1825
4M+/4ML/4MV/4 SiMX	$1819/955/2645/3925

NEC

Pinwriter3300 24pin wide,360dpi,80K	$326
Pinwriter6200 24pin narrow,360dpi,80k	$399
Pinwriter9300 24pin wide.360dpi 333draft	$839
Silentwriter superscript610,6ppm,256k	$471
Silentwriter1097 600dpi,7mb	$1365

FUJITSU

10/10W Laser,10ppm,1/2mb 14/35fts	$830/942

All printers: Cash basis only and come with the Original Manufacturer's warranty. Please call for lead time. No returns on any printer purchase with this pricing.

MEMORIES, MATH-COs & CPUs

MEMORIES for IBMs

SIMMs

256x9 (3 chip)70NS	**$11.95**
1M x 9 (3 chip)-70NS BP	**$39.25**
1M x 9 (9 chip)-70NS Major brand	**$39.95**
4M x 9 (3 chip)-70NS BP	**$119**
4M x 9 (9 chip)-70NS	**$142**
4Mx8-70 maj	**$128**
1M x 9 (3 chip)-60 Major brand	$41
4M x 9 (9 chip)-60NS	$159

ESIMMs(72 Pin)

256x36-70NS	$55
512x36-70NS	$95
1x36-70NS	**$165**
2x36-70NS	**$324**
4x36-70NS	**$509**
8x36/16x36-70	**$1040/2235**
1x36-60NS	$178
2x36-60NS	$339
4x36-60NS	$545
1x32-70 NS	**$146**
2x32-70NS	**$293**
4x32-70NS	**$435**

DRAMs

1x1-70/80NS	$5.50/5.25
256x1-70/80NS	$1.75/1.60
256x4-70/60NS	$5.75/5.50

LASER EXT. MEMORIES

HEWLETT-PACKARD

HP IIP, IIP+,III,IIID,IIIP	1/2/3/4MB	$75/114/155195
HP II, IID	2/4MB	$124/199
HP IIISi	1/4MB	$76/204
HP IV	4/8MB	$165/365
Deskjet 500, 500C, 550C	256K	$88

PANASONIC

KXP 4410/20/30	1/2/3/4MB	$98/148/175/215
KXP 4450 1MB		$137
KXP 4455	2MB	$164

OKIDATA

OKI 400	1/2MB	$98/
1	1	9
OKI 800/820	2/4MB	$123/193
OKI 810	1/2MB	$111/189

CPUs & CPU FANS

INTEL

386 DX33	$40
486 SX25/33	**$73/95**
486 DX 33	**$123**
486 DX 50 (Very hard to get)	**$295**
486 DX2 50	**$175**
486 DX2 66	**$185**
486 DX-4 100	**$455**
Pentium 60MHz	**$399**
Pentium 66MHz	**$469**
Pentium 90MHz	**$625**

AMD

386 DX 33/40	$47/48
486 DX 40	**$158**
486 DX2 50 (Hard to get)	**$168**
486 DX2 66	**$168**
486 DX2 80	**$210**
486 DX4 100	**$325**

CYRIX/TI

486 DLC 33/40	$62/68
486 DX 40	**$108**
486 DX2-50/DX50	**$99/257**
486 DX2-66	**$156**

CPU Fans

486 heat sink and fan	**$7.95**
Pentium 60,66/90	**$12/15**

MATH-COPROCESSORS

INTEL

80387 SX 16/20/25	$45/64/75
80387 DX 16/20/25/33	$35/40/45/80

Overdrives call for latest prices

IIT

3C87SX-16/20/25	$39
3C87SX-33	$39
3C87DX-25/33/40	$39

CYRIX

83S87SX 25	$39
83S87SX 33	$39
83D87-33	$41
83D87-40	$41

Special Terms and Conditions for this Section: CPU and Memory prices change on a daily basis; please call for the latest prices. These products when bought without systems come with a minimum 15 day warranty - please inquire. We do not stock many of the above products - please call for availability.

SOFTWARES

For Networking, Communications, Tape Storage Drivers, Networking Drivers, Multi-Media and Speciality Softwares also look in the corresponding sections.

UTILITIES

Norton Utilities V 8.0	$110
Norton Anti-virus v3.0	$81
QEMM 386 V7.0	$68
AfterDark V2.0 WIN	$28
PC Tools Pro V 9.0A	$89
Disk-Doubler	$52
MickyMouse/StarTrek Screen Saver	$39

DESKTOP PUBLISHING & GRAPHICS

Corel Draw V4.0	$375
Pagemaker V5.0	$499
Harvard Graphics V3 For Windows	$267
Norton Desktop WIN V3.0	$110

DATABASES

Accesss for Windows V2	$295
DBASE IV V2.0	$540
FoxPro For Win v2.6	$93
Paradox V5.0 WIN	$322
Q & A 4.0DOS	$249
Superbase 2.0 WIN	$345
LOTUS SMARTSUITE	$448
Gupta SQL router/SQL server	$174

ACCOUNTING/BUSINESS

CA-Accpac BPI Integrated	$148
CA-Acc. Simply Accounting DOS	$79
DAC Easy Accounting/Payroll 4.3	$94
Works for WIN 2.0	$129
MS Project 3.0 for WIN	$425
MS Office 4.2 (Word,Excel,Pwrpoint,Mail)	$475
MS Office Pro v4.3	$595
MS Office 4.2 OEM standard	$285
MS Office Pro v4.3 OEM package	$349

SPREADSHEETS

LOTUS WORK V3.0	$99
MS Excel V5.0	$299
MS Works for WIN	$123
Quattro Pro V 5.0 WIN/DOS	$54

WORD PROCESSING AND GRAPHICS

AMI Pro 3.1	$240
Professional Write V 2.2	$159
MS Word 6.0 for DOS/WIN	$305/299
Word Perfect 6.0 for DOS/WIN	$319
WordStar 7.0	$264

COMMUNICATIONS

Procomm Plus 2.01/WIN	$70 /97
WinFax Pro V 3.0 for WIN	$99
Norton PC Anywhere 4.5 Host/Rem	$65/86
CrossTalk for WIN	$129

PROGRAMMING LANGUAGES & OPERATING SYSTEMS

M.S. DOS OEM 6.22	**$45**
M.S. OEM Windows 3.1 for PC system	**$49**
M.S OEM WIN FOR WORKGROUPS 3.11	**$56**
M.S. Windows V 3.11 Original	**$92**
Windows NT 3.1 /UPGRADE	$314/278
Novell DOS 7	$59

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QUANTUM
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IDE
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HARD DRIVES
SEAGATE 1.08/Quantum 2.1 GB
9.5MSEC/5YEARWARNTY
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NETWORKING

16BIT NE2000 COMP COAX/TP	$29
16 BIT NE2000COMP COMBO	$39
INTEL 10BT FLASH	$99
8 PORT TP HUB W/AUI	$144
16 PORT TP HUB W/AUI	$339

MULTIMEDIA

8BIT SOUND C/KIT	$39/59
SONY 2X INT IDE	$109
TOSHIBA 4X 3501 Int	$294
NEC 510-CDR 3X	$229
Texel/TEAC Quad CD	$309/239
Mitsumi Quad Speed IDE	$199

COMMUNICATIONS

FAX-MODEMs

PONY 902Z 96/24 Fax(Send)/Mod Int.	$27
PONY 992Z 96/24 Fax/Modem	$39
PONY 992NZ 96/24 F/M, v. 42 bis Enh.	$55
PONY 1414IZ 14.4 F/M, .32/.42 w/Bitfax Int.	$51
PONY 14.4 F/M .32/.42 Int w/Voice prm	$100
PONY 28.8 F/M Int(14.4/28.8)	$93
PONY 992PZ Pocket 96/24 F/M, .32/.42	$63
PONY 1414PZ Pocket 144 F/M, v.32, v.42	$176
PONY 992MG PCMCIA 96/24 F/M v. 42	$132
PONY 1414MG PCMCIA144/144 F/M v.42	$244

AT&T Paradyne

DataPort 14.4 Fax V.32bis Int/Ext	$125/145
Keep In Touch PCMCIA 14.4 S/R Internal	$259

US ROBOTICS

14,4 Sport Mod/Fax V.32b V.42b I/E	$97/111
28.8 Sport M/F v.34 Int/Ext	$218/230
14,4 Mac&FAX Ext. Mod/fax	$154
19.2 HST Courier Ext modem	$389
Modem Sharing Single/Dual Kit	$548/964
World Port Pocket 14.4 Mod/fax Int	$255

SUPRA

14.4 Budget Int/Ext. F/M	$85/119
14.4 Class I Int/Ext F/M	$113/139
14.4 Class II Int/Ext F/M	$154/183
28.8 Int/Ext F/M	$219/249

HAYES

Accura 14.4 F/M .32/.42 Int/Ext	$149/159
Optima 14.4 F/M .42 Int/Ext	$359/372
Optima F/M PCMCIA	$285
Optima 14.4 F/M Pocket	$335
Optima 28.8P F/M	$449

ZYXEL

U-1496B 16.8/14,4 VoiceFax SW,S/R Int	$318
U-1496B+19.2/14,4 Voice Fax SW,S/R Int	$429
U-1496E 16.8/14.4 VFax SW,S/R LED Ext	$298
U-1496E+ 19.2/14.4VFaxSW,S/R LED Ext	$419
U-1496+ 19.2/14.4VFaxSW,S/R LCD Ext	$625
U-1496+19.2/14.4 S/R LCD MAC Ext	$639
U-1496E+ 19.2/14.4 S/R LED MAC Ext	$429

PRACTICAL PERIPHERALS

14.4 Fax/Modem S/R Internal	$143
14.4 Fax/Modem S/R External	$154

Miscellaneous

XIROM 14.4 PCMCIA	$
Megahertz 14.4 PCMCIA Type3	$298
Motorola 14.4 Int/Ext	$call

NETWORKING PRODUCTS & SERVICES

ETHERNET Adaptors

NE 2000 Plus Comp 16bit Coax/10BT	$29/29
NE2000 Plus Comp Combo soft&hard config	$36
NE 2000 COMP COMBO AUI+BNC+RJ45	$51
D-Link 16 Bit,SoftConfig. 10BT 1/6 Pack	$70/377
Intel EtherExpress 16/5pk/20pk	$106/480/1752
Intel EtherExpr 16 MCA C/16 MCA TP	$177/177
Intel EtherExpress 32 EISA/Flash 32C	$427/232
Intel EtherExpFlas TP/C 5/20pk	$141/632/2368
SMC Ethcard 16 Elite Ult Cx/6 Pk	$109/581
SMCEthcardEliteUltraCOBO 1/6	$125/625
SMCEthcard+Elite16Cx/TP1/6	$121/625
3 Com 503 Etherlink II 16 Bit Coax/TP	$164/173
3 Com 507 Ethlink II 16 Bit Coax/TP	$279/316
3 Com 509 Ethlink III Coax/5Pk	$121/533
3 Com 509 Eth III Combo bulk 5/20	$139/531/1909
3 Com 529 MCAIII 10BT/5pk	$229/970
3Com 579 EISA Coax/10BT	$229/229
EagleNE2000 Plus/5Pk	$88/389
EagleEP2000T Plus/5pk	$80/343
Asante Etherpack2000+ Coax/10 BT	$130/110
Microdyne NE2000 Plus	$89/81
HP Ethertwist PCLink/6pk	$159/759

ARCNET

16bIT Star/bus Topology-combo	$77
4Port Passive Hub	$19
8 Port Coax stackable Active Hub	$147

ADAPTERS for TOKEN RING

Intel Token Express 16/4 ISA/MCA	$360/413
SMC Token Ring Adapter 16/4	$261
3 Com Tokenlink III 16/4 ISA/EISA	$361/540
IBM Token Ring 4Mbps AdapII	$312
IBM TR 16/4 AdapII ISA	$405

POCKET LAN ADAPTERS for Notebooks

Advanced LAN Net Coax/10BT	$116
XIRCOM PE3 10B2/BT/BC	$278/274/312
XIRCOM 16/4 MBNS Tokenring w/Type 1Bnc	$525
Xircom 16/4 Tokenring w/Type 1BNC	$455
Xircom Ethertalk w/scsi&DB25	$314
DLINK DE-600 Softconfig. Coax10BT	$167/167

PCMCIA ADADAPTERS for PalmTops

DLink DE-650 Coax/TP	$173/173
IBM TR Adapter 16/4	$375
NATIONAL NE4100 COAX/10 BASE T	$176/176
XIRCOM Credit Card BNC/RJ-45	$229/240
XIRCOM Token Ring Combo 9pin/RJ45	$466
NEWMEDIA;PCMCIA10BT/COBO	$146/167
3COM589TP Etherlink III	$192
3COM689 Tokenlink III 1Ppack	$375

Concentrators

CeLan 2-Port BNC/AVI Repeater	$228
Ce-Lan 4-Port BNC/AVI Repeater	$423
Allied Telesis 4-Port Repeater 2AVI,2BNC	$748
Allied Telesis,4-Port,8BNC, 1AVI	$684
Allied Telesis,8 -Port,8 BNC, 1AVI	$804

BRIDGES

Allied Telesis local Ethernet Bridge	$1645
3 Com 802C NetBuilder local Ethernet	$3399
3Com 750 NetBuilder Token Ring local	$4714
3Com 5823C NetBuilder Remote	$5319
Synoptics 3323S Ether Local w/AVI	$2353
Synoptics 3522 Token Ring	$5319
Novell Multiprotocol Router v 2.0	$669

Hubs

CeLan 8 Port 10 BT w/BNC Cascade port	$155
CeLan16 Port 10BT w/AUI exp. port	$369
Comp LAN 14Port SNMP	$490
Allied Telesis 24 Port SNMP Slave	$1129
Asante 8 Port Hub,8RJ45,1BNC	$247
Asante 12 P1BNC Thin,1 AUI Thick w/SNMP	$843
Asante 1701 Smart 12Ports/SNMP	$972
Microdyne 18 port 10 Base T5000 series	$619
D-Link 12 Port 10 BaseT	$390
D-link DE-1500 w/SNMP	$816
D-link K1612 56Port w/SNMP	$2361
Intel EE 12 Port 10 BT Hub Int w/Harmonica	$597
Intel EE 12 Port Hub Int EISA w/Harmonica	$681
SMC 8 Port Concentrator	$309
SMC 12Port Tiger Hub	$418
Synoptics 2800 A 16 Port w/AVI	$554
Synoptics 2803/2804 16 Port	$614/828
3 Com Link Builder 3C621 12 Port	$714
3 Com Link Builder FMS 24/48 port	$1179/2689

PRINTER SHARING

Ethernet/Tokenring/Appletalk

Internal-card seats into slot in printer

JetpressXOI HPIID.IIID 10bt/2	$329
Jetpress XIO same token ring 16MB	$530
Jetpress MIO HP IV/M/SI/3SI/1200L	$337
Jetpress MIO Plus w/Extra 1P,1S	$410
Hewlett-Packard jetdirect available	$call

External-compact in-line device

Intel Netport II for 10BT/2(1P,1S/2P)	$390
Intel Netport II Tokenring w/DB9	$549
Intel Netport Xps XL Ether/Token (2P+1S)	$447/599
Castelle Lanpress 2P+2S Combo	$445
Castelle Lanpress 1P+1S/2P+2S Token	$521/592

Portable-fits into one printer port

Eagle NPE400 pOCKET 10BT/2	$340
Xircom Pocket 10BT/2	$291
Xircom Tokenring STP connector	$544

DEDICATED PRINTING BASED

Simple AUTO-SWITCHING

2 Computers to 1 printer Electronics	$24
4 Computers to 1 printer Electronics	$38
2 Computers to 1 Printer Bi-directional S/P	$49/45
4 Computers to 1 Printer Bi-directional S/P	$69/61
*Fax Swithcer 2 Port Fax/Telephone	$85

PRIMAX Advanced Printer Sharing

PrinterNET Transm/Rec. kit (w/25')	$69
PrinterNET Starter kit	$155
(It can connect 16 computers to 6 printers)	
ModularLink Transm DB-25(w/25')	$40
ModularLink Receiver Cen.	$45
ModularLink Starter Kit	$106
(It can connect up to 16 computers to 1 printer)	
Prima NET starter kit	$249
Transmitter/Receiver kit w/25" cable	$99
(It can connect 32 nodes in peer-to-peer networks)	

CABLES & CONNECTORS

Readymade w/Connectors 10'/25'/50'	$4/6/9
RJ45 10BT patch cabnles 7'/25'	$4/6
Token Ring patch cable	$23
RG58 Bulk SPOOL	$80
RJ45 10BT 1000' level4/5	$119/130
BNC 50 Ohm Terminators/Crimp-ON/Barrel	$1.49
BNC T-Connectors	$1.99

Novell Netware

Ver 3.12 5/10/25/50 User	$613/1495/1935/2623
Ver 3.12 100/250 User	$3783/6667
Ver 4.02 5/10/25/10 User	$843/1677/2355/3399
Ver 4.02 100/250 User	$4699/9143
Ver 4.02 500/1000 User	$15375/27932

Peer-to-Peer Networks

Novell Personal

Novell Personal 2 user kit includes: (2 NE2000 Comp. cards,cables,Personal software)

all this for only	$159
1 user NPN kit (add on) Coax/10BT	$75
NPN software only....OEM/Orig	$45/75
Novell DOS 7 (incl. NPN)	$55

Windows for Workgroup

WFW v 3.11 retail version(incl. windows)	$147
WFW v 3.11 OEM version (incl windows)	$63
Add-on WFW v 3.11 (no win)	$55
Windows NT Advances server	$922
Windows NT v 3.1 upgrade	$276

Artisoft

LANtastic 6.0 Dos/Win Soft-1 pk	$88
LANtastic 6.0 5/10/25 Pack	$340/604/1191
LANtastic 6.0 Net starter kit	$241
LANtastic 6.0 Add-on kit BNC/10BT	$129
LANtastic Z 5.0 (2 station)	$95
LANtastic for TCP/IP 5.0-1 Pk	$212
Upgrade v6.01 1/5/10PK	$44/99/139
LANtastic NR 2000C/T-1/5PK	$181/1000
LANtasticNR 2000M/TC for PS/2	$266
Noderunner/SI 2000C/T 1/5Pk	$87/362
Nodrunner/SI Conbbo PS/2	$132
Core Stream-Server4 5 users	$643
Core Stream-Server w/LAN 6.0 5user	$777

Electonic Mail

By cc:Mail

CC:Mail Dos 4.02/Win 2.03/Unix 1.1	$77
CC:Mail Macintosh 2.1/OS/2 1.03	$77

Lic. pack: *(adding users to platform pack no-docs)*

CC:Mail 10/25/100 user 4.0	$call

Remote Users : *(For connecting one remote/mobile user to any CC : Mail user net via Public Telephone Lines)*

CC:Mail mobile Win 2.0/Mac 2.03/Dos 3.4	$146

Gateway: *(For exchange of messages with other Automatic Directory Exchange(ADE) Import/Export*

CC:Mail Router v5.1/Fax 1.2	$217/1353
Link to SMTP v2.0/UUCP	$421/352

By Microsoft

PC Mail server 3.2 (Incl 10 user Lic.)	$440
PC Mail 5/20/100 users	$259/838/3325
PC Mail Remote client v3.2	$133
MHS gateway	$637
SMTP/X400 Gateway	$3201
Fax Gateway	$1245

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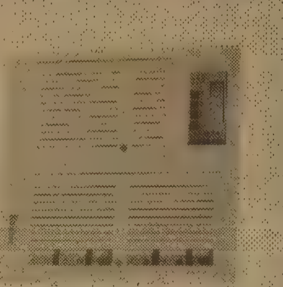

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APC-BK400,10MIN,286,386SX,WS	$158
APC-BK450	$215
APC-BK600,15 min,386/486 FS	$259
APC-BK900/12000,15min,Multi-FS	$367/487
Power doctor/Call UPS	$69/102

SMART UPS (ON-LINE/AUTO BACKUP)

APC 400, 10 min,286,386 FS/WS	$288
APC 600,15 min,386,486 FS/WS	$335
APC 900,15 min CAD/CAM WS/FS	$496
APC 1250,15 min,Multiple FSs	$613
APC 2000,20 min, Mini computers	$1095
Matrix UPS 3000 VA, Multi-server	$2869

INTERFACE KITS/SMART MONITORING

Power chute Plus for Novell/nix,Xen.	$64/98
UPS Monitoring board for Novell	$61

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Translated by Taku Fujita

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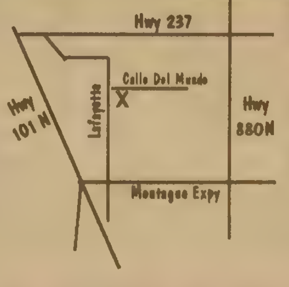

Santa Clara, CA

TERMS AND CONDITIONS

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• 80486DX-33 MHz	159
• 80486DX-50 MHz	259
• 80486DX2-50 MHz	$165
• 80486DX2-66 MHz	215
• 80486SX-25 MHz	74
• 80486SX-33 MHz	105

A.M.D. CPU CHIPS

•80486DX-33MHz	$150
•80486DX-40 MHz	179
•80486-2-50 MHz	189
•80486-2-66 MHz	195
•80486-2-80 MHz	229

CYRIX CPU CHIPS

•CX 486DX-33	$119
•CX 486DX-40	125
•CX 486DX2-50	129
•CX 486DX-50	219
•CX 486DX2-80	220

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1x9-70 3 Chip	39
1x9-80 3 Chip	37
1x9-80/70/60 9 chip	39/40/41
1x9-10	32
4x8-70/80	117
4x9-70	134
4x9-80	132
4x9-60	134

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1x8-100 8 Chip	$29
1x8-80 2 Chip	33
1x8-70 2 Chip	34
1x8-80/70 8 Chip	33
2x8-80/70	89
4x8-80/70	124
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256K VRAM	CALL
512K VRAM	CALL
16/32/64/128MB Kits for Quadra 700/900 & Mac IIfx, ci	CALL
NEW 72 PIN SIMM for MAC LCII & CENTRIS	CALL

72 PIN SIMMS (36 BIT)

256Kx36-80/70	$40/49
512Kx36-80	79
512Kx36-70	85
1x36-70	165
1x36-60	168
2x36-80/70/60	317/325
4x36-70/60	495/515
8x36-70 NEW	1050

32 BIT SIMMS ALSO AVAILABLE

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DRAMS

256x1-80	$1.49
256x1-100	1.39
256x1-120	1.29
256x4-60/70/80	4.99
64x4-80/100	2.59
1x4-80 DIPP	35
1MBx1-70	4.99
1MBx1-80/60	4.99
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64x4-10/12 Page, 18pin	$6.00
256x4-80/70 Page, 20pin	7
256x4 Video Page 28pin TC524256Z-70	8
256x4 Video 28pin TC524256Z-60	7.50
1x4-80/70 Page 20pin ZIPP	20
1x4-80/70 Page 20pin DIPP	32

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32Kx8-20	$4.99
32Kx8-15/12	5.99
64x4-20	5
64x4-15	5.50
8Kx8-20	2.75
8Kx8-15	3
16Kx4-20	2.75
16Kx4-15	3.50
64x1-20	6.75
64x1-15	8.50
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128x8-25	21

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287-10	$39
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287XL Intel Tube	49
387SL Intel Tube	49
387SX-26/20/33	49
387SX-25 Cyrix	39
387SX-33 ULSI	34
387DX-20 Intel Tube	20
387DX-25 Intel Tube	32
387DX-33 Intel Tube	45
387DX-40 Cyrix/IIT	34
4167-25/33 Weitek	200/375

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LASER PRINTER MEMORY

Price includes Memory, Board & Installation Instructions

IBM LASER

4019/4019E 1/2/3.5 MB	$89/129/179
4029 (All Model) 4 MB	179

EPSON LASER

6000-2/4MB	$135/215
7000-1/2/3 MB	125/149/189
Action LaserII-2/3/5 MB	159/205/299

HP LASER

HPII/IID 2/4 MB Board	$135/219
HP 4/4M 4/8MB	185/345
HP IIP,IIP+,III,IIID,IIIP 1/2/3/4	85/135/155/220
IIsi 4/8 MB	179/345
DeskJet 500/500c 550C 256K	85
Design Jet Plotter 4 MB	185

PANASONIC LASER

KXP4410/KXP4430 1/2/3/4 MB	$95/135/175/235
KXP4420/4450/4451 1/2/3/4 MB	95/139/185/245
KXP4450 1 MB	119
KXP4455 2 MB	139

OKI LASER

OL400 1/2 MB Board	$109/139
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QMS LASER

PS 410 2/3/4 MB	$149/195/225
PS 860, 1700 1/4/8 MB	89/133/179
PS 815, 825, 815MR, 2/4/6	168/232/295

SHARP LASER

9500PS 1 MB	$75
JX-9500/9700 1/1.5/2.5/4	110/135/175/245

OTHERS

Apple Laserwriter II/IINT/IINTX 4 MB	$235
Brother HL-4 2/3/4 MB	145/182/235
Brother HL-8E V 1/2 MB	99/139
Compaq Pagemarq 15 & 20 1/4/8	79/139/266
Kyocera F800, F800Am F800T 2/4	95/137
NEC Silentwriter 90/290	109/124
NEC Silentwriter 95 2 MB	109
TI Microlaser 1 MB	98
Packard Bell Video Memory 1 MB	39

DELL MEMORY

Model		P/N	
433P,33P,325P,33D,325D			
	1 MB	310-2505	$89
	4 MB	310-2507	169
433TE, 425TE & Powerline Workstation			
	2 MB	310-2466	$129
	4 MB	310-2467	189
	8 MB	310-2468	349
	16 MB	310-2469	669
Power Desktop 486D, D/33, D/25, D/20, D/66			
	1 MB	310-2505	$89
	4 MB	310-2507	169
	16 MB	310-2625	669
OTHER MODELS			CALL

MEMORY BOARDS

- RAMpAT 16 Bit .... $85 • RAMpAT Plus 125
- SIMMply RAM for PS/1 16 Bit 149
- SIMMply RAM 159

TEAC FLOPPY DRIVES

1.44 MB	$45
1.2 MB	49
Dual Floppy 1.2/1.44	129
Heat Sink w/Fan For 486's/Pentium	10/18

COMPAQ MEMORY

Model		P/N	
LTE 286	1 MB	117081-001	$89
	2 MB	117081-002	125
	4 MB	117081-003	219
SLT 286	1/4 MB	110237-001	99/259
LTE 386S/20	2 MB	12125-001	129
	4 MB	121125-002	195
Contura Lite 20/25			
	2 MB	129769-001	125
	4 MB	129769-002	235
	8 MB	129769-003	395
Portable 386	1 MB	107651-001	125
	4 MB	107653-001	310
Portable III	2 MB	10-7332-001	125
	EBD	167811-001	225
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Bus Available:	32-Bit PCI 32-Bit VLB
Display Memory:	2MB or 4MB VRAM
Video Connector:	DB-15
Video Signal:	Analog

COMPATIBLE DRIVERS SUPPORT:

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- MS-Windows for Workgroups
- MS-Windows NT
- MS-Word (DOS)
- OS/2 v2.1, Warp
- Autodesk ADI 4.2
  - AutoCAD
  - AutoShade
  - 3D Studio
- Microstation
- Lotus 1-2-3 Release 2.x
- WordPerfect 5.1
- CADKEY/DataCAD
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- SCO Open Desktop

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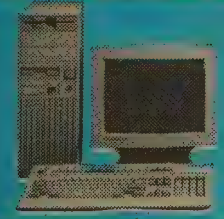

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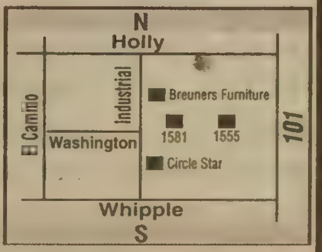

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*Panasonic 562/563 Double Speed	$135
*NEC 3Xi Internal SCSI/OEM	$399/289
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*SMC Elite Ultra 16-bit Combo (Single/6 Pak/24 Pak)	$99/499/2049
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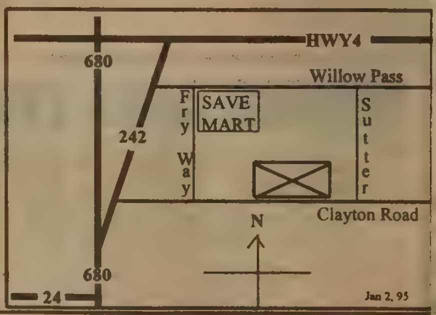

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- Keytronics 101 Keyboard
- Med. Tower Case w/230W Power Supply
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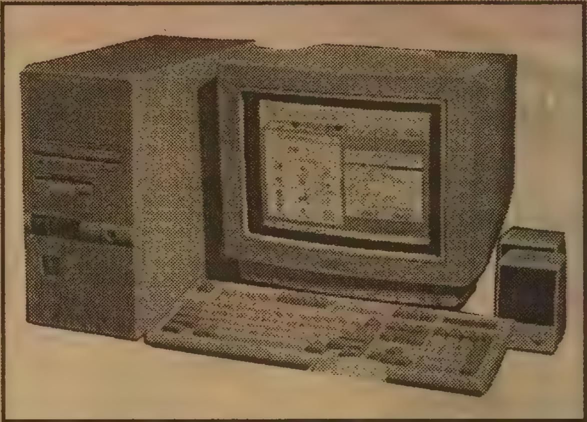

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- 2 Serial, 1 Parallel Ports
- VLB Orchid Kelvin 64 w/1 MB DRAM
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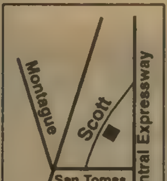

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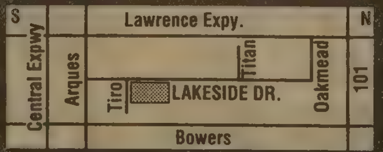

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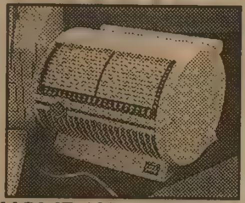

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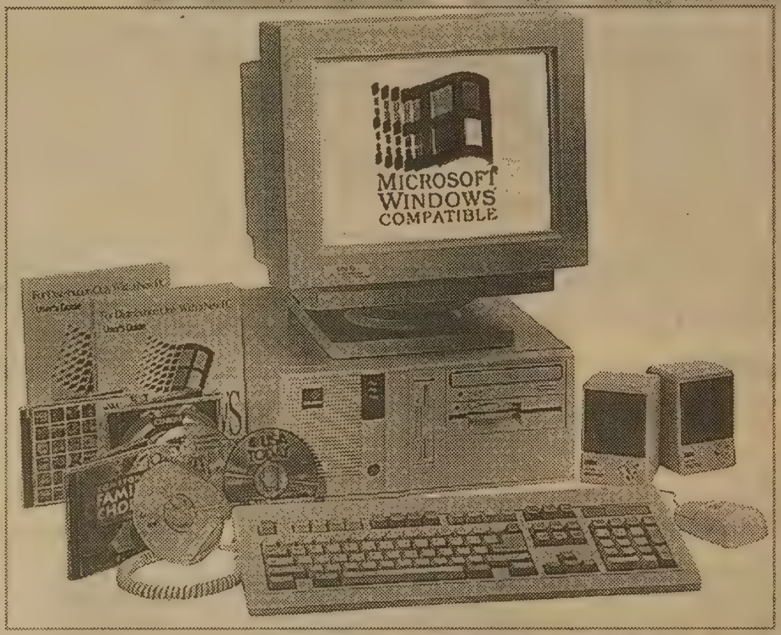

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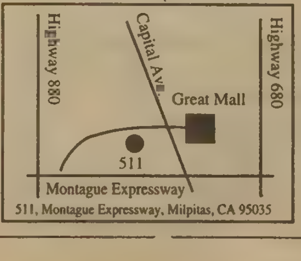

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- 1.44 MB Floppy Disk Drive
- PCI Enhanced IDE Interface
- 2 Serial, 1 Parallel, 1 Game Ports
- PCI Accelerated Video Graphics 1 MB (2 MB Max)
- ViewSonic 15" Non-Interlaced Flat Screen Monitor
- Deluxe Mini Tower/Desk Top Case w/200W PS
- 101 Enhanced Spill Proof Keyboard
- Microsoft Compatible Mouse w/Pad
- 1 Year Parts, 3 Years Labor Warranty

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- 14" .39dp Hi-Resolution Color Monitor
- Mini Tower/Desk Top Case w/200W PS
- 101 Enhanced Spill Proof Keyboard
- Microsoft Compatible Mouse w/Pad
- 1 Year Parts, 3 Years Labor Warranty

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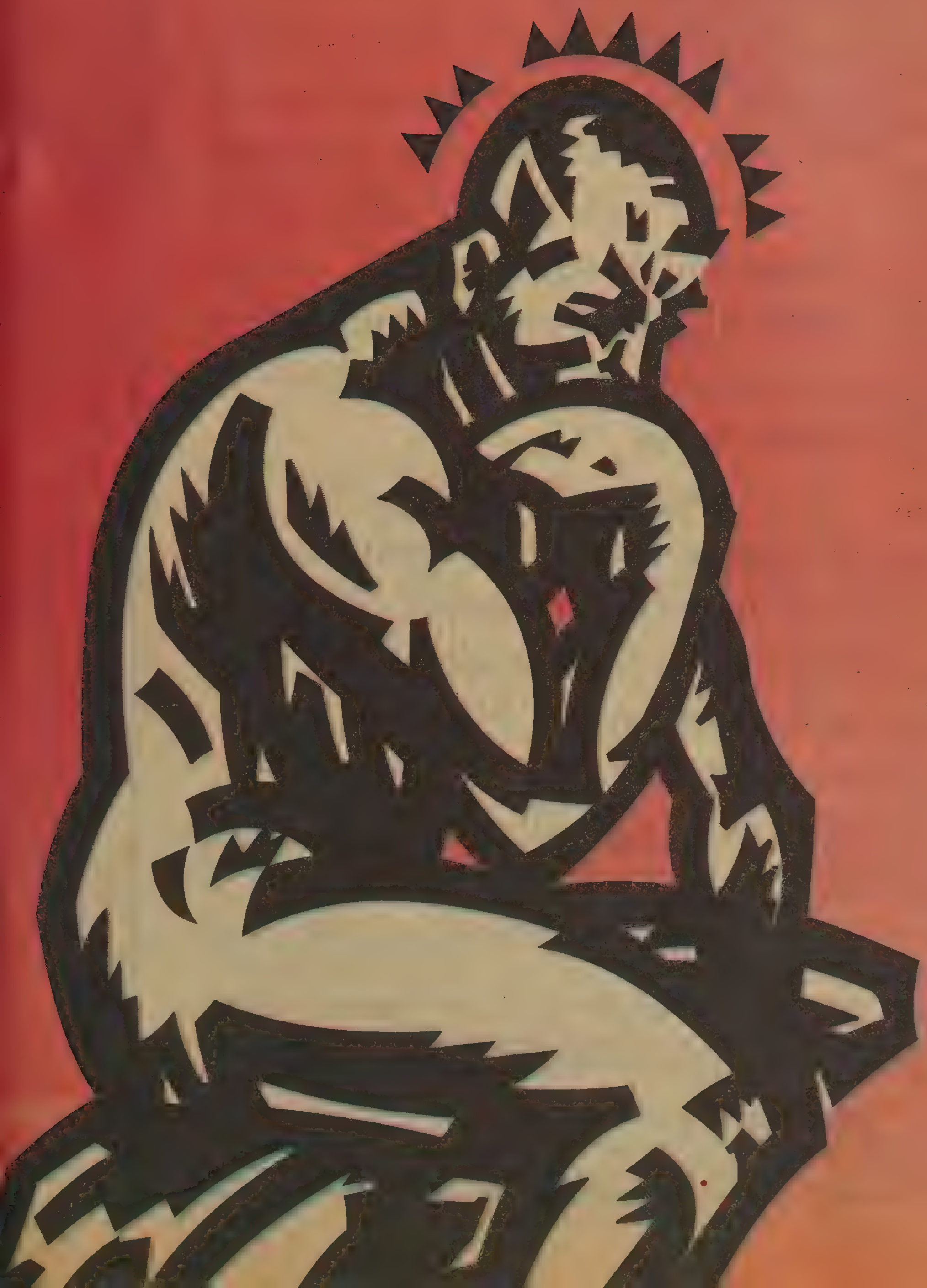
- Stereo Speakers
- CD Package Includes: Groliers Encyclopedia, Animals, U.S. World Atlas, 14 Exciting Games

The Eighth Annual MicroTimes 100

Movers, Shakers, Good Citizens, And Others Who Made A Difference To The Computer Industry In 1994



Addressing the lunch crowd at the recent PC Outlook conference, AMD's Jerry Sanders allowed as how he was having a little trouble with the transition from *enfant terrible* to *eminence grise.*

Compared to the adjustments some of his colleagues had to make in 1994, this was a pretty benign problem.

On the positive side, some real breakthroughs took place in 1994, after years of what amounted to incremental improvements of existing technology. Mosaic and then Netscape took the world by storm as computer users everywhere got Web fever, launching a communications and publishing revolution not seen since the advent of the laser printer. Meanwhile, Mac pioneers Bill Atkinson and Andy Hertzfeld unveiled General Magic's new technology, which may well live up to its promise of creating a personal communicator useful to real humans.

On the other hand, paralleling the lackluster performance of the Newton, the PDA market not only failed to take off, many once-hopeful startups crashed and burned.

Meanwhile, applications vendors were rapidly deciding that it was impossible to compete with Microsoft. Borland was in the doldrums. Quarterdeck's future was uncertain after the departure of its founders. DEC, IBM, and Lotus, among others, were struggling with self-reinvention.

1994 saw a major epidemic of acquisition fever—Novell bought WordPerfect to augment its previous acquisitions of UNIX and Digital Research, and at year-end Lotus was reportedly being courted by both Oracle and AT&T. Microsoft, meanwhile, did some empire-building of its own by announcing plans to acquire Intuit.

More than anything else, 1994 was the year in which the industry discovered that people's need to communicate with each other was a great business opportunity. Consequently there was explosive growth in the areas of wireless communication, online services, and everything Internet.

We hope you enjoy checking out the names and faces of this year's 100, and that you're on the lookout for next year's.

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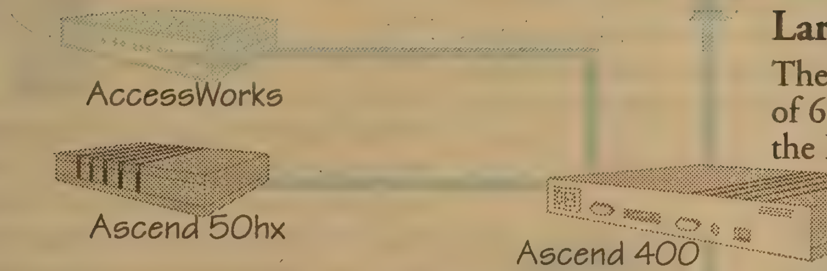

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MicroTimes 100

Man of the Year:

Marc Andreessen

Netscape

For years the industry's been waiting for the next "killer application." In 1994, as the whole world caught Web fever, Andreessen's work with Mosaic and then Netscape drove computer-based publishing and communications to whole new frontiers. (See accompanying interview.)

Sheldon Adelson

The Interface Group

Chairman and CEO

Adelson's flagship show COMDEX once again threatened to overwhelm Las Vegas this year, and continued its global expansion. Despite wails from nearly all constituencies in the industry that COMDEX is too big (and occasional attempts to capitalize on this notion by hopeful show promoters), the industry gathering-of-gatherings shows no sign of losing momentum.

Will Adelson's longtime interest in the gambling industry (he owns the Sands Hotel, among other primo Vegas properties, and lobbies in favor of gambling in Israel) converge with the emerging development of online transactions? We'll see...

Beny Alagem

Packard Bell Electronics

Chairman, President, and CEO

Less than a decade ago, entrepreneur Alagem purchased the rights to the Packard Bell name from Teledyne and went into the computer business, perceiving an opportunity in high-volume retail sales.

While the highly competitive mass market has been a bloodbath for other vendors, Packard Bell has established itself as the market leader in the US for that channel, now accounting for over 43% of sales. Specializing in plug-and-play systems configured especially for the first-time user, the company's kept a finger firmly on the pulse of the consumer market and adapts quickly to its changing demands.

Robert Allen

AT&T

Chairman and CEO

Allen has made some bold moves to focus AT&T's efforts and launch it into the next century, from the acquisition of McCaw Cellular to a variety of video-on-demand and other pilot projects. He's streamlined operations and is well on the way to making the aging giant a lean, mean info-services competitor in a global marketplace.

Paul Allen

Investor

Allen, who co founded Microsoft with Bill Gates and still holds significant amount of stock in the company, found himself in the headlines over his attempts to acquire a controlling interest in America Online, an effort he officially abandoned in 1994.

Nonetheless, Allen's been acquiring and founding companies that position him as a leading force in most of the interesting areas of emerging technology—his holdings range from Interval Research to TicketMaster. As the owner of the Portland Trail Blazers as well, he's also got a nice little niche carved out as an NBA-licensed content provider...

Efi Arazi

Electronics for Imaging

CEO

Arazi was an early believer that the demand for color graphics constituted a business opportunity, and today his technology is a mainstay of color-intensive environments from corporations to ad agencies. On the hardware end, the Fiery server converts color laser copiers to work as high-speed PostScript printers; the EfiColor color management software and other tools offer precision control to graphics professionals.

Marc Asch

Minnesota House of Representatives

Asch says, "I am the father of the Minnesota House gopher which was the first legislative gopher on the Net, and we think still the best."

Opposing Clipper was very popular during 1994, but in Minnesota, where the health insurance business is big and the concern for privacy of medical records heartfelt, Asch made a compelling case to his fellow legislators that the federally favored Clipper wasn't nearly strong enough for them.

The result was an amendment (in italics) to the state's statutes governing the administration of its health care program:

"Encryption must follow encryption standards set by the national bureau of standards and approved by the American National Standards Institute as ANSIX3. 92-1982/R 1987 to protect the confidentiality of the data. Social security numbers must not be maintained in unencrypted form in the database, and the data must never be released in a form that would allow for the identification of individuals. *The encryption algorithm and hardware used must not use Clipper Chip technology.*"

Bill Atkinson
Chief Scientist

Andy Hertzfeld
Software Wizard,
Senior Vice President
General Magic

While it's perhaps true that the other Bill 'n' Andy got more headlines during 1994, these much-revered members of the original Macintosh team certainly got more unadulterated affection. They had a triumphant return of sorts as they unveiled their Telescript and Magic Cap technology to an adoring SRO crowd at Macworld in January, on the tenth anniversary of the Macintosh itself.

The first device incorporating the technology, the Sony Magic Link, shipped in the fall of 1994; expected early this year is Motorola's Envoy, the first wireless product, which will more fully exploit its features. At the convergence of personal assistants and online transactions, General Magic has a host of strategic investors and technology partners and could be one of the key players as a new dimension in mobile computing takes shape.

Carol Bartz
Autodesk
Chairman, President, and CEO

During 1994, Autodesk passed IBM as the world's largest producer of CAD-related software. Pleasing both the company's technically demanding customers and Wall Street, former Sun VP Bartz strengthened Autodesk's position both in its traditional CAD market (which saw the shipment of AutoCAD Release 13) and the explosively growing multimedia arena, where 3D Studio has prospects of becoming a similar standard.

As the leading vendor of tools for creating both real and virtual stuff, Autodesk's potential in the next few decades is obvious; Bartz's ability to get the best from her various constituencies, from programmers to customers to financial analysts, makes it all seem highly likely to be realized.

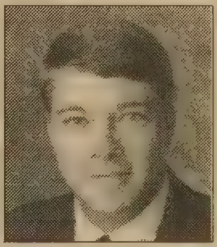
Daniel Ben-Horin
CompuMentor
Director

Paralleling the growth of many a Silicon Valley startup, Ben-Horin has built CompuMentor from a small ad-hoc volunteer organization to a significant presence in the local nonprofit world, which it serves with a variety of computer support. 1994 also saw the expansion of the organization's efforts to the K-12 world, helping teachers and students realize the benefits of technology.

Dennis Bennie
Delrina
Chairman and CEO

Cofounder Bennie has built Delrina to a position of supremacy in the booming PC fax marketplace, offering easy-to-use products that critics and consumers swear *by* instead of *at.*

This core business was augmented by Delrina's foray into the screen saver market, where it achieved instant notoriety with a portrayal of Bill and Opus shooting down the competition's flying toasters. Happily, after a war of words among Delrina, Berkeley Systems, cartoonist Berke Breathed, and hundreds of impassioned kibitzers on the Net—with scenic forays into Jefferson Airplane cover art—yet another look 'n' feel lawsuit was averted.

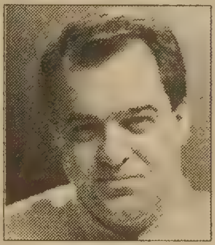


Charles W. Berger
Radius
Chairman and CEO

After a year that included the acquisition of longtime crosstown rival SuperMac, Berger has Radius positioned to take long-term advantage of the growing demand for multimedia. The company's products, from monitors to accelerator boards, are a mainstay of both professional and consumer systems, especially on the Macintosh platform, where PowerMac upgrades are an attractive new business.

Tim Berners-Lee
World Wide Web Creator

Berners-Lee developed his first hypertext system, Enquire, in 1980, for his own use. In 1989, while working at CERN, the European Particle Physics Laboratory, he created the World Wide Web, "an Internet-based hypermedia initiative for global information sharing." The initial prototype was developed on the NeXT. In March 1993, when NCSA Mosaic was first released, WWW traffic on the Internet measured 0.1%. Six months later it measured 1%, and has continued to grow exponentially. To address the soaring international need, a CERN-MIT agreement formed the W3 Consortium in July 1994. Berners-Lee coordinates WWW development from the W3C US office in the Laboratory for Computer Science at MIT (MIT/LCS).



Jim Bidzos
RSA Data Security
President

The outspoken Bidzos, whose company's secure encryption products are a key component of communications products from Lotus Notes to General Magic's Telescript, was much in the press during 1994, darkly hinting of FBI threats against his person and often objecting loudly to the federal government's proposed and notoriously insecure Clipper standard. The Clipper hazard was at least partially averted, but not before Bidzos had sent out large quantities of ominous SINK CLIPPER posters, destined to become collector's items.

BMUG

An international force for good, BMUG established a new presence in cyberspace with a forum on Apple's eWorld, providing thousands of Macintosh users with quick and easy access to resources from tech support to shareware. The organization also hosted numerous noteworthy events during the year of the Mac's tenth anniversary, not least of which was a stellar presentation by Mac demigods Bill Atkinson and Andy Hertzfeld of their new work with General Magic.

Jeff Braun
Chairman and CEO

Will Wright
Chief Software Designer
Maxis
Cofounders

The vision that began with SimCity has brought forth a veritable Sim-Mania, as do-it-yourself alternate universes from Planet Earth to ant colonies emanate from Maxis's Orinda headquarters to an eager audience. The Sim products, recently joined by the blockbuster SimCity 2000, have garnered awards from trade, gaming, and educational organizations alike. Maxis products, which also include the program-your-own-fish-DNA aquarium El-

Fish, manage to be both complex and engaging, and are finding favor with consumers from power users to children.

Kaye Caldwell

Software Entrepreneurs' Forum

President

We'd like to thank frequent denizen of this list Barbara Cass, executive director of SEF, for bringing Caldwell to our attention. Says Cass: "For several years, Kaye has served as our link to what is going on in both state and federal legislative arenas. She is currently also serving as president of the Computer Software Industry Association and is policy project director of the Software Industry Coalition. She served on the program committee for the 5th Computers, Freedom & Privacy conference. She has participated in the International Intellectual Property Study Group, and also has been appointed to the legislative committee for the Council of Regional Information Technology Associations."

So a hearty round of applause to Caldwell for her hard work in all of these areas crucial to a developing software industry. And a few cheers as well to Cass and her intrepid crew at SEF.

Maria Cantwell

Congressional Representative

D-WA

Armed with hundreds of email and fax messages from concerned computer users and high-tech businesses, first-time representative Cantwell initiated legislation in Congress that would have removed government restrictions on the export of secure cryptography, an issue that affects such products as Lotus Notes and System 7 Pro.

It was a fine effort in electronic democracy. Alas, it achieved little except to garner Cantwell an astonishingly patronizing letter from Vice President Gore.

Cantwell was defeated in the November elections.

Meanwhile, individuals concerned about the issue continued to disseminate copies of Phil Zimmermann's free program Pretty Good Privacy (PGP), and large corporations considered the advantages of evading export controls by hiring newly unemployed Russian crypto wizards offshore.

Doug Carlston

Brøderbund

Chairman and CEO

Early in 1994, Carlston abruptly dropped plans for a merger with Electronic Arts, thereby bucking a general converge-o-mania that characterized the software business during the year. It turned out to be a good move, as Brøderbund became one of the darlings of the edutainment boom, from the elusive yet ubiquitous Carmen Sandiego, who's attained classic status and gone CD-ROM, to book-based preschool titles. However, the company's most noteworthy achievement during the year was the perpetration of Myst, which, depending on how you look at it, is either an incredibly complex and beautifully designed virtual world or the biggest drain on the technology industry's productivity since the Internet worm.

Denise Caruso

Analyst

Despite the demise of the short-lived *Technology & Media* newsletter for which she'd left *Digital Media and Seybold*, Caruso is much in evidence as one of the more clear-thinking and hype-immune analysts of the multimedia scene. She's been known to bring highly imaginative panel discussions to a screeching halt by inquiring just what is going to cause real people to spend their hard-earned bucks for the hypothetical technology in question, a question that needs to be asked early and often these days.

Steve Case

America Online

President

Case was just unstoppable this year, as AOL continually launched new services, improved its software, passed the million-user mark, avoided being acquired by Paul Allen, and generally closed in aggressively on longtime leader CompuServe and populous-but-troubled Prodigy. At year's end, the stock split 2-1 yet again, the company announced increased participation in cable-based pilot projects, and Case staked out major turf on the info highway with the acquisition of several companies including Internet backbone architects ANS.

Vinton Cerf

The Internet Society

President

MCI

Senior VP for Data Architecture

Often called "The Father of the Internet," Cerf's career is closely intertwined with its evolution. As a graduate student at UCLA in the 1960s, he worked on the design and implementation of host communication protocols for the first Interface Message Processor (IMP), which in September 1969 became the first node of the ARPAnet. In 1972 he coinvented TCP/IP with Robert Hahn. He interrupted his research to serve as chief engineer of MCI Mail from 1982–1986, and has recently returned to MCI to oversee design and development of the network architecture to support MCI's future Net services.

In a recent interview in *Wired* with Steve Cisler, he said of the ARPA/Internet, "it was supposed to be a highly robust technology for supporting military command and control... Along the way, it became a more research-support infrastructure, and now has become the best example of global information infrastructure that we have."

Ronald Chwang

Acer America

President and COO

Currently wholly owned by parent company The Acer Group in Taiwan, Acer America is expected to have its first public stock offering in the US in the near future as part of Acer's "global brand name, local touch" strategy. Chwang has brought the company to a position of strength and leadership in its own right, as its revenues nearly doubled over the previous year, its local production (which supplies a significant percentage of Acer's exports) exceeded 50,000 units per month, and the company, for the first time, broke into the ranks of top-ten computer suppliers in the US.

In both Latin America and Southeast Asia, however, Acer's #1, so Chwang's got his work cut out for him.

Steve Cisler

Apple Computer

Librarian

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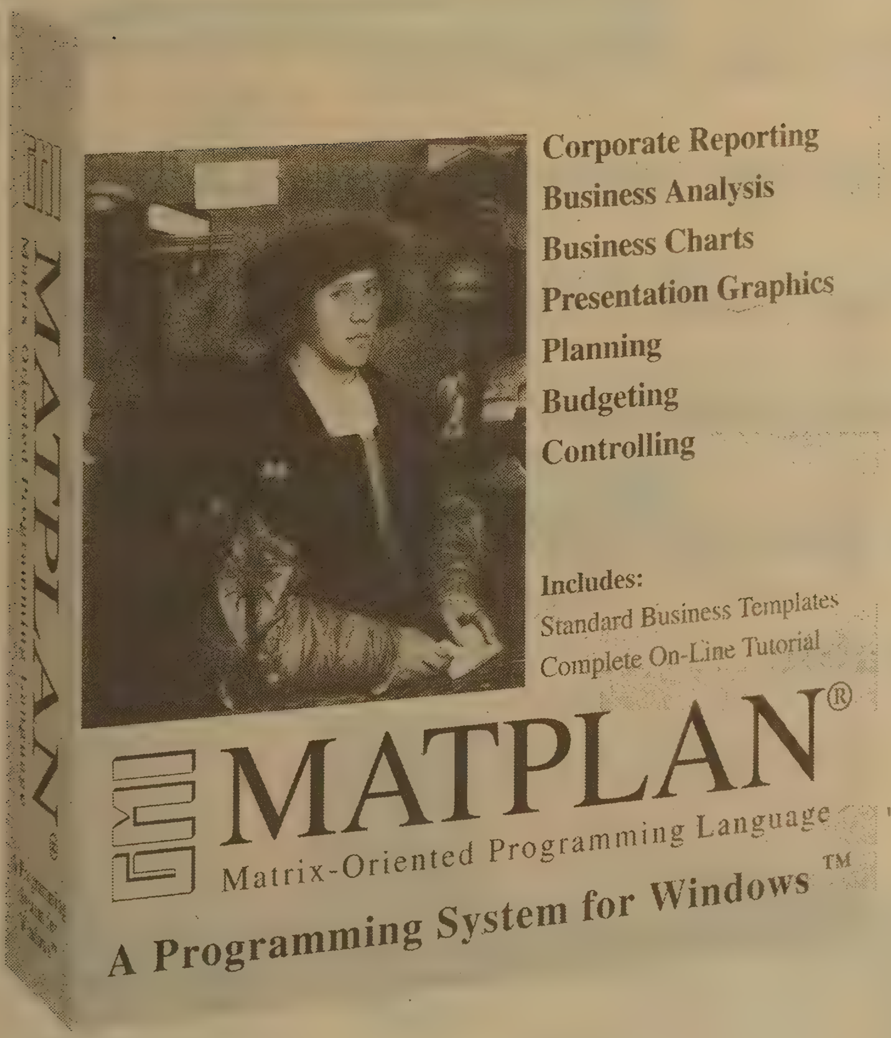
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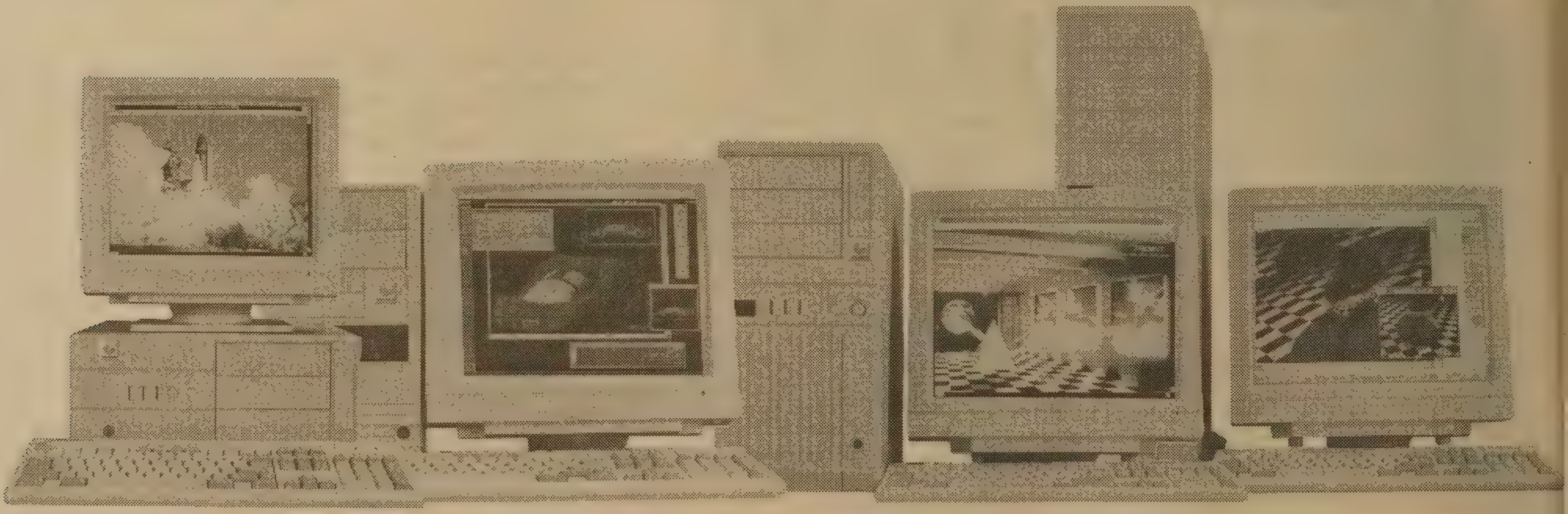

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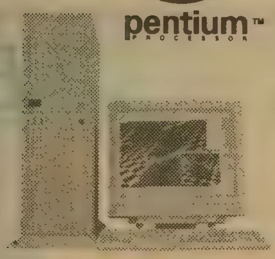

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Microsoft Mouse
Microsoft Windows 3.11 & DOS 6.22

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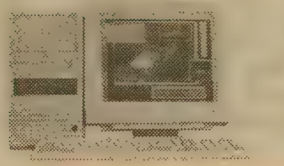
Viking Server



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Intel® 486 CPU w/256K Cache
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On Board PCI IDE
Hi Speed IO
ATI PCI VGA w/1MB
1.44 Floppy Drive
Mini Tower Case w/200W Power Supply
Microsoft Mouse
Microsoft Windows 3.11 & DOS 6.22

DX2-66	*$1999*
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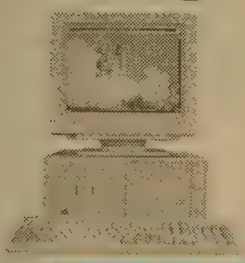
Viking Workstation



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VESA VGA w/1MB
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Microsoft Mouse
Microsoft Windows 3.11 & DOS 6.22

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fields of libraries and community networking, Cisler has become one of th industry's leading figures in the quest for human-friendly technology tha adapts to local needs. Among his many responsibilities is running Apple' Library of Tomorrow grant program.

"The Ties That Bind," a landmark conference held in May as a result of Cisler' efforts, brought together hundreds of sysops, government agency types entrepreneurs, and others to explore what was and wasn't working, from th Santa Monica PEN system to educational Mac-based virtual villages in Sout America. Much catalyzing and idea-sharing resulted, to the benefit of all.

Jim Clark
Netscape
Chairman

After over a decade as the chairman and visionary of Silicon Graphics, Clark moved on to Netscape (originally Mosaic Communications), a new venture that almost immeforces with Marc Andreessen and most of the original NCSA Mosaic development team, Clark's planning to deliver the technolo gy to enable secure commercial transactions, from home shopping to stoc trading to publishing, over the Internet. Over a million users have downloade the client software; with the Bank of America one of the first to announce a ser vice based on Netscape's technology, acceptance on the server side seem assured.

Scott Cook
Intuit
Chairman

One of the few who managed to beat Bill Gates at his own game as Quicken regularly trounced Microsoft Money, Cook built Intuit into the undisputed ruler of the PC-based financial world. It was therefore something of a surprise when he an Gates agreed to a highly amicable acquisition of Intuit by Microsoft. Cook, wh will remain with the company, is expected to be instrumental in Microsoft' entry into the world of online transactions.

William Davidow
Mohr Davidow Ventures
General Partner

In view of how well it predicted many of the year's industry trends, we'd like t give yet another salute to the book Davidow coauthored with Michael Malon *The Virtual Corporation.* It's been out for a couple of years now, and probabl did more than any other contemporary work to galvanize the business worl around leanness, meanness, just-in-time everything, and continual self-rei vention. It was a testimonial to the book's effectiveness that on a rece episode of *60 Minutes*, multimedia entrepreneur Mick Jagger explained at co siderable and accurate length the ways in which the current Rolling Stone world tour is a perfect example of a virtual corporation.

Jan Davidson
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become even bigger in edutainment. With everything from math tutorials to kid-level multimedia authoring systems, Davidson had a banner year in 1994.

Marilyn Davis

Frontier Systems

Proprietor

Reader Ann Scheurell recommends Davis to our attention for her work in a relatively uncharted area of electronic democracy, developing eVote software at her own expense. This UNIX-based program allows secure voting and tallying on networks and conferencing systems.

Says Scheurell, "Dr. Davis and a growing number of people believe that if we were to use the Internet to exercise a people's form of discussion-driven democracy, we could actually make our government work again. eVote embeds into conferencing systems to support discussion-driven democracy—for community networks, and anywhere else consensus building provides answers. A developer's kit and software are available today, while Davis keeps safe the source code for the central 'Clerk' until the online community votes to take responsibility for it. eVote is a gift for a democratic world."

Sky Dayton

EarthLink Network

CEO

"A young entrepreneur with a community-based desire to serve," says the reader who brought Dayton to our attention. Convinced that you shouldn't have to be a UNIX weenie to enjoy the benefits of the Internet, Dayton launched EarthLink, a user- and wallet-friendly Internet service provider, in Los Angeles in the summer of 1994, and the system is currently one of the fastest-growing in the country.

Bart Decrem

Plugged In

Director

Decrem has done a lot of good in the community of East Palo Alto, giving local kids both vital skills and a boost in self-esteem with this innovative multimedia-oriented learning program. With determination, ingenuity, dedicated volunteers, and lots of support from computer corporations in the area, Decrem and Plugged In have developed widely acclaimed learning activities that are inspiring imitation in other areas.

John Doerr

Kleiner Perkins Caufield and Byers

Partner

One of the venture capital industry's most technically knowledgeable representatives, Doerr is a leading force in emerging communications markets. While remaining an interested observer of such long-term endeavors as nanotechnology, he's currently focused on areas like education, wireless, and connectivity.

Dixon Doll

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As a consultant and a venture capitalist since the late

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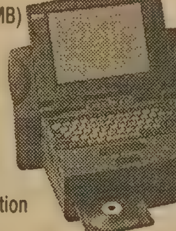

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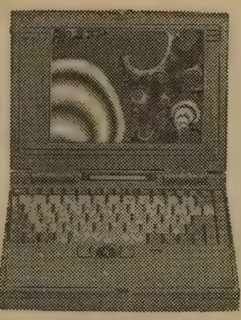

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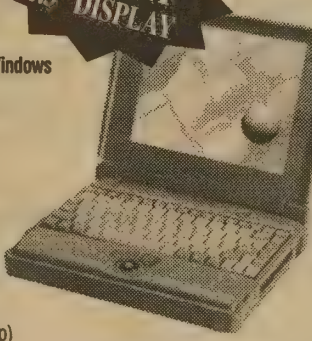

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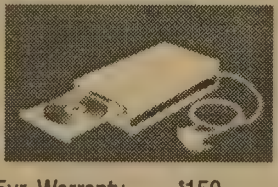

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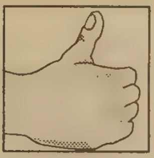

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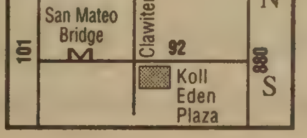

1970s, Doll was one of the first to recognize and develop the potential of the emerging communications market. With Accel Partners, where he was a partner until late 1994, he was instrumental in the funding and growth of such networking successes as Network Equipment Technologies, Racotek, Bridge Communications, Alantec, Optilink, and Vitalink Communications. He continues to strongly influence the evolution of these technologies, particularly as they interface with the emerging Internet and information services.

Brian Dougherty

Geoworks

Chairman

Despite the failure of the PDA market to reach epic proportions, which swept many hopeful companies away

Heroes Of The Net

Reader David Newman writes in appreciation of the myriad and often unknown collaborators who bring us the benefits of the Internet:

"I nominate the Web and its creators—and Mosaic; the whole family tree, so it would be Tim Berners-Lee and CERN for the Web, and Marc Andreessen and his buddies at NCSA/UIUC, then Jim Clark, and the Mosaic licensees like Spry/ORA and the others; and Mosaic Communications (now Netscape), and even Mozilla, their mascot, who has earned a spot on your cover. [*Well, Mozilla's not on the cover, but will you settle for Andreessen? —eds.*]

"It would be like a virtual company portrait; those who absolutely, completely, and irrevocably transformed the Internet into something that could be used by anyone; it provided a cartoon-like, stunningly easy-to-use interface onto an untold number of Web, FTP, and other server resources at an untold number of sites; creating singlehandedly the whole embryonic but quickly growing Web industry.

"Alongside, I would nominate all of the people who offer shareware and freeware to the Net in the form of enlightened self-interest: the creators of Eudora; Steve Dorner; John Norstad for NewsWatcher; the creators of Gopher, Anarchie; especially Cornell University's CU-SeeMe video conferencing software; Richard Cogger... you get the idea.

"These are the Johnny Appleseeds of the Net, planting seeds of trees that are gonna grow well beyond our little lifetimes."

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3C509TP0 20 Pack	$1,639
3C509TP0 60 Pack	$4,500

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New Lower Prices on HP Advanced Stack Hubs

12 Ports	$622
24 Ports	$1,070
48 Ports	$2,002
SNMP Module	$480

ASANTE 8-Port Hub *NEW LOW PRICE* $195

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For a limited time only, buy an Exabyte 4mm DAT drive and get Cheyenne's FIRSTserve NLM software FREE! FIRSTserve offers the same features as Cheyenne's infamous ARCserve software (except for local workstation backup capabilities). Offer good thru January 31, 1995.

EXB-4200C Int. 4-8GB DAT Drive	$1,062
EXB-4200C Ext. 4-8GB DAT Drive	$1,236

Coax Ethernet

3COM 3C509B Etherlink III/5-Pack/20-Pk	122/531/1,929
3C529 Etherlink III MCA Single/5-Pack	245/1,034
INTEL EtherExpress 16/5-Pk/20-Pk	115/499/1,869
EtherExpress 16 MCA	184
NOVELL/EAGLE NE2000 Plus	109
NE2000 Plus 3/5-Pk	129/421
NE2/2C 16-bit MCA	207
SMC Elite Ultra Coax/6Pk/24Pk	99/544/1,990
EtherCard Elite/A For PS/2	192
Elite 32 Dual Segment EISA Coax	657
3COM 3C579 32-bit Coax/5-Pack	247/1,042
EAGLE NE3210 32-Bit EISA CX & TP for WS	220
NE3200 32-Bit EISA CX & TP	480
NE2/32C 32-Bit MC	440

10 Base-T Twisted Pair Ethernet

MILAN Transceiver (AUI-BNC)/(AUI-RJ45)	49/49
3COM 3C509TP 16-bit/5-Pk/20-Pk	122/489/1,759
3C509B-TP0 16-bit 5-Pk/20-Pk/60-Pk.	469/1,668/4,514
3C509B COMBO/5-Pk/20-Pk	135/584/2,109
3C523B 10 Base-T MC/5-Pack	340/1,579
Ethernet Super Bundle (12 ports w/5 cards)	1,080
INTEL EtherExpress Pro TP/5-Pk/20-Pk	110/489/1,519
EExpress Pro TP&BNC/5-Pk/20-Pk	110/514/1,898
EEx Pro TP w/FLASH/5-Pk/20-Pk	124/533/1,672
EEx Pro TP&BNC w/FLASH/5-Pk/20-Pk	124/559/2,050
SMC Elite Ultra 16TP/6-Pk/24Pk	99/482/1,689
Elite Ultra Combo/6-Pk/24-Pk	110/544/1,990
Elite 10T/A 10 BaseT MCA	198
Elite 32C Ultra EISA Combo	249
Elite 32T Dual Segment EISA TP	657
EtherPower PCI 10BT/5-Pack	180/841
EtherPower PCI Combo/5-Pack	204/938
3COM 3C579 EISA 10BaseT/5-Pack	247/1,042

100 MegaBit Lan

3COM 3C770A EISA FDDILINK-STP/UTP	1,066/819
3C771A EISA FDDILINK-Fiber	1,436
INTEL EExpress Pro 10/100 PCI Combo	235
EExpress Pro 10/100 EISA Combo	352
NATIONAL SEMI NF3000-F-1 FDDI ISA Fiber	1,336
NF3000-T-1 FDDI ISA UTP/UTP	956/984
NF3500-F-1 FDDI EISA FIBER	1,230

Token Ring

3COM Tokenlink III 16/4/10-Pk	260/2,389
TokenLink III EISA 16/4	576
IBM Token Ring 16/4 Adapter II	426
INTEL TokenExpress Pro 16/4	277
PROTEON P1392+ Token Ring 16/4/10-Pk	430/4,049
SMC Token Ring Elite 16/4 Single/12-pack	264/2,900

PCMCIA/Parallel Port Adapters

3COM TokenLink III PCMCIA TR	415
IBM Credit Card Ethernet Adapter Coax/10BT	242/261
Credit Card Token Ring 16/4 Adapter	480
NATIONAL SEMI PCMCIA Ethernet Adapter	189
SMC ElitePort EtherNote Combo	235
XIRCOM Pocket Adapter III 10BaseT	284
Pocket ENET III Combo(BNC & 10BaseT)	325
Pocket Token Ring TYPE1/TYPE3	484
Pocket Ethernet Fax/Modem 10BT/BNC	494
Performance Series PCMCIA 10BT/Combo	225/274
Performance Series PCMCIA Token Ring	492
PCMCIA Ethernet Fax/Modem 10BT/Combo	564/696

Concentrators & MAUs

3COM Linkbuilder TP/12	350
ASANTE 8-Port Concentrator *(New Low Price!)*	195
12-Port Concentrator	395
ALLIED TELESYN 4/8/12 Port (AUI)	209/229/456
MICRODYNE 5318+ 16 ports w/AUI	547
SYNOPTICS 800 8-port/2800A 16-port	294/572
SMC 3608TP 8-Port/12-port Concentrator	304/568
Elite 4000C TR Mau 8-port/16-port	723/1,153
MADGE 8 Station Token Ring Hub	490
3COM Linkbuilder TR 3C510180	1,912

SNMP Manageable Concentrators

3COM Linkbuilder FMS II TP Hub-12 ports	598
Linkbuilder FMS II TP Hub 24-pt/48-pt	1,102/2,300
Linkbuilder FMS II TP Mgmt Module	505
DAVID SYSTEMS ExpressNet 12-port w/SNMP	1,248
HEWLETT PACKARD Advanced Stack 12-port	622
Advanced Stack 24-port/48-port	1,070/2,002
Advanced Stack SNMP module	480
Advanced Stack 12-port w/SNMP	995
Advanced Stack 24-port w/SNMP	1,348
Advanced Stack 48-port w/SNMP	2,329
NETWORTH 3/6/10 Slot Chassis	677/935/2,081
24 Port 10BaseT Host/Smart Module	1,655/2,554
16 Port Snappable Hub	930
16 Port SnapNet Bundle (1 Hub/5 Nic)	1,267
48 Port Snappable Bundle	2,603
24 Port TriSegment Stackable Hub	1,288
24 Port TriSegment Mgmt. Hub	2,041
PowerPipes Ethernet/FDDI Switching Hub	7,487
SYNOPTICS 810M 8 ports w/ AUI managed	572
2803 16 ports w/AUI/ w/FIBER	649/875
2813-04/2813-05 16 ports w/AUI	1,576/1,010
2814-04/2814-05 16 ports w/FIBER	1,791/1,246
3000N 12 Slot Chassis	1,814
3308A 12 Port module	1,105
3314A-03 Mgmt. Module w/Basic SNMP	2,064
3314A-04 Mgmt. Module w/Advanced SNMP	3,266

Network Management

3COM Trancend FMS Mgmt for Windows	352
ASANTE View for Windows (In-Band/Out-of-Band)	710
CHEYENNE Monitrix Network Mgmt.	583
FRYE NetWare Management	339
HEWLETT PACKARD OpenView Interconnect	2,070
OpenView Workgroup Manager	1,420
INTEL LanDesk Manager	1,070
LanDesk SNMP Gateway/Response	569/712
LanDesk Traffic Analyst	720
LanDesk OpenView for Windows	1,789
NETWORTH Hubview or HubView for NMS	733
NOVELL Lanalyzer for Windows v2.1	1,055
NetWare Management System	1,692
NetWare Management Agent Single/20 Pk	338/5,382
NetWare LANalyzer Agent v1.0 (Single)	1,008
NetWare LANalyzer Agent (Multiple Segment)	1,692
SABER Lan Workstation 1st node/add 1	129/39

Repeaters

TUT Systems XL1501 (Single unit)	1,029
XL1502 (2BNC/2RJ11)	1,448
XL1503 (1BNC/1RJ11/1AUI)	1,086
XL1504 (4BNC/4RJ11/1AUI)	2,814
XL600+ 600' Repeater (1 Pair)	500
Dual Port Repeater BNC/BNC	293
Quad/Octo Port Repeater (4 BNC/8 BNC)	368/662

Tape Backup Solutions

CHEYENNE ARCserve v5.01 NLM 5/10	254/510
ARCserve v5.01 NLM 25/50 users	890/1,082
ARCserve v5.01 100/250 users	1,181/1,536
ARCserve v5.01 500/1000	2,982/5,934
MacAgent/SCO Unix Option	330/337
Changer Option for v5.0/Stacker Option	465/470
PALINDROME Backup Director NLM	569
Network Archivist NLM	1,224
COLORADO Power Tape 1.1GB w/o Ctrl	650
Power Tape Int. 2GB SCSI Tape Drive w/Ctrl	1,055
Power Tape Ext-25 2 GB SCSI Tape Drive w/Ctrl	1,251
Power Tape 50-4 GB SCSI Tape Drive w/Ctrl	1,664
Power Tape Ext 50-4 GB SCSI Tape Drive w/Ctrl	1,870
ARCADA Backup Exec NetWare 3.X/4.X NLM	658
Backup Exec NetWare Enterprise NLM	833

Bridges/Routers

ROCKWELL NetHopper NH-1 TCP/IP Async Rtr	1,661
NetHopper NH-3 TCP/IP Async Router	2,835
NetHopper NH-P NetWare Async Router	1,375
EAGLE NW2000 2-port Wan Adapter/v.35 Cable	550/75
MICRODYNE Synchronous+ Wan Adapter v.35	880

Network Modems/Comm. Servers

MICRODYNE ACS for NetWare Connect	
ENET 4 ports w/ modems/ w/o modems	5,647/4,127
ENET 8 ports w/ modems/ w/o modems	CALL
NOVELL NetWare Connect 2/8/32 pts	415/1,583/4,077
NetWare Connect 2-port w/Modem and I/O	1,118
NetWare Connect 8-port w/Modem and I/O	4,182
SHIVA Net Modem/E 9600 BNC	1,567
Lanrover 4E/8E ports w/o modems	2,574/3,550
Lanrover 8E Plus w/14.4 modems	7,600
Lanrover 8E Plus w/Async ports	4,439
U.S. ROBOTICS Ethernet Lan Modem 2-port	1,570
Token Ring Lan Modem 2-port	1,961
DIGIBOARD Digi 2-Port for NetWare Connect	200
Digi PC/4E 4-Pt/8-Pt for NetWare Connect	455/588

Network Printing Solutions

CASTELLE Jetpress XIO BNC/10Base-T	381
Jetpress MIO for HP4/MIO PLUS	349/451
LANPress 10BT (1 PAR)	313
LANPress THIN/10BT (1PAR/1SER)	362
LANPress THICK/10BT (2 PAR/2SER)	512
EAGLE NPE400 1 LPT, BNC & 10BT	350
HEWLETT PACKARD JetDirect 10BT/Combo	330/400
JetDirect Token Ring	562
INTEL Netport EL for Ethernet/Token Ring	427/588
NetportExpress XL for Ethernet/Token Ring	475/660
MILAN Fastport 3000 1P/1S, BNC/10BT	459
Fastport 3100	710
Fastport 3500X TR Multi-Protocol	654
XIRCOM Print Server 1 LPT, Ethernet/TR	300/590
Performance Series 1 LPT, COMBO	432

Network Fax Solutions

CASTELLE FaxPress 1000, 10BT/BNC	1,576
FaxPress 2000 2-Line/4-Line	2,693/3,493
CHEYENNE FaxServe NLM 5/10/25	259/331/465
FaxServe NLM 50/100/250	599/800/1,135
FaxServe NLM 500/Unlimited	2,005/3,207
INTEL Satisfaxtion Modem 200/400	244/315
Net Satisfaxtion 25 users/1000 Users	780/1,040
DELRINA Winfax Pro for Networks (Server)	125
10/25/100 Users	678/1,492/2,836
Starter Kit (1 Server, 2 nodes)	270
U.S. ROBOTICS Fax Server Ethernet/TR	1,962/2,198

Network CD-ROM

MERIDIAN CD-Net for DOS v4.31 (10 Users)	467
CD-Net for DOS v4.6 (10 Users/WAN)	648
CD-Net for NetWare (NLM-10 Users)	467
CD-Net for NetWare 100/250 Users	938/1,445
MICRO DESIGN SCSI Express for NetWare, MDI	599
SCSI Express for NW3.X, Non-MDI(20 Users)	910
SCSI Express for NW3.X, Non-MDI(250 Users)	1,332
CD-Rom LaserBank 600CD Ext. Sin./Dual	599/1,117
MICROTEST Discport Ethernet/Token Ring	599/799
Discport w/Plextor Ext. CD-Rom	1,026
Discport w/Plextor 4-Unit CD-Rom	2,598
Discport w/Plextor 7-Unit CD-Rom	3,732
DiscServ NLM/DiscShare	529/332
DiscShare	332

Uninterruptible Power Supplies

APC Back-UPS 600/900/1250	300/429/574
Powerchute Plus for Novell/Unix	99/149
Smart-UPS 400/600/600RM/900	320/382/492/544
Smart-UPS 1250/1250RM/2000RM	674/808/1,159
Smart-UPS Series W/PC+ AP600NET	450
AP900NET/AP1250NET/AP2000NET	621/755/1,223
Matrix 3000/5000/Smartcell	2,741/4,076/537
SNMP Agent/SNMP Mgr for NMS	125/145

Cable Testers & Supplies

RG58 & RG62 Rachet BNC Crimper/RJ45	45
RG58 Ethernet BNC-Crimp (100 pak)	125
RJ45 10 BaseT Connectors (100 pak)	40
10Base-T Cable (1000' min) LV3/LV 5	100/200
BELDEN PVC RG58 or RG62 Cable (1000' min)	175
PLENUM RG58 or RG62 Cable (1000' min)	350
MICROTEST MT350 Value Kit	1,918
Penta Scanner	3,110
Fiber Solution Kit	1,366

Novell Software

Lan WorkPlace for DOS Single/10 Users	290/1,445
Lan Workplace for Mac Single/10 Users	289/1,437
Lan WorkGroup-5/10/20 Users	1,125/1,866/2,613
NetWare for Mac v3.12 200 Users/v4.0	685/851
Multiprotocol Router/Router Plus	720/1,032
NetWare NFS Single/5-pk	3,259/10,537
NetWare NFS Starter Kit	1,065
NetWare NFS Gateway 5/10 User	1,069/1,797
Global MHS v2.0 20/50/100 Users	358/648/1,064
MHS v1.5 Network Edition 10 Users	140
MHS v1.5 Network 50/100 Users	504/733
MHS Multi-Network Edition 10 Users	140
MHS Multi-Network 50/100 Users	504/733

E-Mail

cc:MAIL Desktop-Any Platform	72
10 users/50 Users	361/1,715
Group Pack 10-pack DOS/WIN	638
Mobile for DOS or MAC	150
Router/Fax	95/1,459
Link to SMTP v2.0/Link to UUCP	2,473/370
MICROSOFT PC Mail Server + 10 Users	485
PC Mail 5/20/100 Users	273/930/3,633
MHS Gateway/PROFS	708/3,405
SMTP/X400 Gateway	3,405/3,405
FAX Gateway	1,419

Network Utilities

BRIGHTWORKS Fusion Software 100-User	1,164
Automatic Inventory 100-User/250 User	534/763
SYMANTEC Anti-Virus for NetWare	889
SABER Server Manager NLM	499
CHEYENNE InocuLAN (20/100/250)	253/387/505
Utils for NetWare	257
COREL Network (RAID/CDROM/OPTICAL sw)	420
FRYE Early Warning System or Lan Directory	339
INTEGRA Oasas RAID (Software Only)	535
INTEL LanDesk Virus Protect (Single)	696
LanDesk Virus Protect 4-pk/20-pk	2,070/6,757
MICROTEST Lan Assist/Map Assist	265/360
SYMANTEC Norton Admin. 5/10 Users	247/438
Norton Admin. 25/50/100 Users	1,068/2,028/3,680

Peer-to-Peer Networking

ARTISOFT LANtastic 6.0 Network Starter Kit	244
LANtastic 6.0 Add-On Kit Coax/10BT	131
LANtastic 6.0 Software Single/5/10 User	99/354/637
LANtastic 6.0 Software 25/50 Users	1,272/2,118
LANtastic Managament Serv./Advan	144/578
Central Station NetWare	358
Noderunner/SI Coax or TP/Combo	124/154
Noderunner/SI Coax/TP (5 pack)	423/440
Lantastic for MAC	433
Lantastic for TCP/IP Single/5 Pk	220/883
CorStream 5/10/25/50 Users	699/1,362/2,209/2,754
NATIONAL SEMI Personal NetWare Starter Kit	260
One Station Expansion Kit	161

Server Mirroring

EAGLE NMSL/C Mirror Server Link	806
NMSL/F Mirror Server Link	1,174
MICRODYNE NMSL/C Mirror Server Link	826
NMSL/F Mirror Server Link	1,204

Wireless Adapters

PROXIM RangeLAN ISA Adapter	434
RangeLAN Roaming Software	99
SOLECTEK Wireless ISA Kit (2 cards)	1,494
PCMCIA Wireless Adapter	674
ISA Wireless Adapter	652
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in a deluge of red ink, Dougherty has managed to succeed in this niche. With ever-smaller and more efficient versions of the GEOS operating system, which runs on a variety of hand-held devices including Casio/Tandy Zoomers and Sharp's PT-9000, he's taken advantage of Microsoft's delays with WinPad and consolidated market share, building alliances and winning investment from such heavyweights as Novell and Hewlett-Packard. He's also established a presence in the portable-connectivity market with versions of the America Online and CompuServe software for hand-held computers.

John C. Dvorak

Author

Long before multimedia was a household word, Dvorak was a multimedia kind of guy—radio, books, magazine columns, you name it. He's the focus of the biggest love-hate relationship in computer journalism, with few readers neutral on the subject. He's rumored to be strategizing for expansion onto the Info Superhighway, with the Dvorak Channel said to be at the early-concept stage and seeking investment.

Esther Dyson

Release 1.0, RelEAST

Having delegated the editorial responsibilities for *Release 1.0* to Jerry Michalski, Dyson is heavily involved in efforts to create mutually beneficial connections between the Eastern European techs and the US computer industry. She's a notable catalyst, serving on numerous boards and holding the annual PC Forum at which movers, shakers, and hopefuls congregate to get things done.

Larry Ellison

Oracle

President and CEO

Now that he's addressed Oracle's problems of a few years back and once again firmly entrenched it as the Lion King of the relational database world, Ellison has gone after the interactive video market, launching several collaborative projects with assorted telcos and computer companies around the world. He's also a strong booster of massively parallel computation, a technology that's somewhat out of favor at the moment but which he thinks ultimately will provide an unbeatable edge in both the RDMS and multimedia markets.

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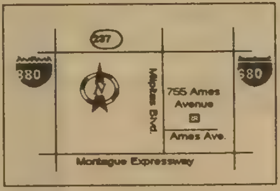

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Robert Frankenburg
Novell
Chairman, President, and CEO

Recruited from Hewlett-Packard, where he dramatically improved the performance of its networking division, Frankenburg replaces revered chairman/CEO Ray Noorda, who retired in 1994. He faces some formidable challenges, the most visible of which is Microsoft's direct aim at the network business.

Arriving shortly after Novell acquired WordPerfect, Frankenburg also faces the task of defining and coordinating the operations of the company's very different but interdependent businesses: applications, networking, and UNIX. However, Frankenburg seems well qualified to achieve this and advance Novell in a rapidly changing and growing market.

Louis Freeh
Federal Bureau of Investigation
Director

One of the year's unambiguous winners, Freeh combined political savvy with raw determination to achieve the passage of the Digital Telephony bill, which requires telephone service providers, under penalty of heavy fines, to make their equipment wiretap-ready.

In the shock waves that followed President Clinton's signing of the bill into law on October 22, privacy enthusiasts redoubled their pursuit of better encryption software. Freeh, meanwhile, went on record as saying that if Digital Telephony wiretaps delivered only encrypted "garbage," he'd probably seek legislation restricting the private use of cryptography as well.

David, John, and Randy Fry
Fry's Electronics

They were considerably ahead of the curve on the current trend to combine technology and consumer goods, and the Fry Bros.' unique retail concept has enabled them to stay ahead of the competition. They've withstood the onslaught of CompUSA in fine style and are now confident in the face of a new invasion from Minnesota's Best Buy.

Chris Galvin
Motorola
COO and President

Grandson of the company's founder, Galvin is currently leading Motorola's efforts in the wireless communications market. One strong interest is Iridium, a consortium in which Motorola is a major shareholder, which plans to build a global satellite network for a full range of mobile voice and data services.

On another front entirely, 1994 saw the successful debut of a host of machines based on Motorola's PowerPC CPU, intended to offer a RISC-based platform to compete with Intel's technology.

Bill Gates
Microsoft
Chairman

Gates had quite a year: acquiring Leonardo's notebook, topping the *Forbes* 400 list of wealthy individuals in the US, emerging unscathed from the FTC's antitrust investigation, and handily retaining Microsoft's domination of the operating systems market despite the delayed advent of Windows 95.

Not resting on any laurels, however, Gates was on the lookout for new endeavors for Microsoft. One of his most noteworthy accomplishments in this regard was the acquistion of Intuit, the financial software company that enjoyed the rare status of competing successfully with Microsoft. Intuit, in combination with Microsoft's announced Marvel online service, stands to put Microsoft in an excellent position as a provider of home banking and other financial transactions.

Louis Gerstner
IBM
Chairman and CEO

Gerstner's ongoing cost-cutting and structure changes have succeeded in making Big Blue a lot leaner and meaner. While far from out of the woods, the company's got cause for rejoicing—the ThinkPad notebook computers are a hit, the PowerPC machines show good promise, and OS/2 has continued to gain market share in the absence of Windows 95. After a year and a half of running IBM, Gerstner has halted the torrents of red ink and restored the giant to the verge of profitability.

George Gilder
Author

In his books *Microcosm, Life After Television*, and the forthcoming *Telecosm*, as well as his columns in *Forbes*, Gilder explains his vision of an emerging and extremely interconnected world—and where its opportunities lie. An outspoken conservative, he was much in the headlines during 1994, challenging FCC Chairman Reed Hundt's radio spectrum auction on the grounds that technology made bandwidth scarcity a non-issue.

Jock Gill
White House
Aide

Gill has long been a prime mover in getting the executive branch onto the info highway, and it's thanks to much of his work that now anybody with an Internet connection can send virtual bouquets or brickbats to president@whitehouse.gov—indeed, Web travelers can now set the controls for http://www.whitehouse.gov and get a multimedia tour of the White House.

William Gross
Knowledge Adventure
President and CEO

Recognizing that there's more to educational multimedia than recycled versions of text, Gross has pioneered a highly interactive approach to fun and learning. His young company has already garnered numerous awards for such products as Dinosaur Adventure and Space Adventure, and entered into alliances with AT&T and Steven Spielberg.

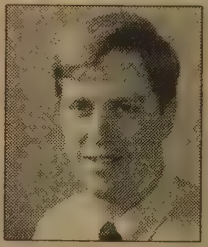
Andy Grove
Intel
CEO and President

While the Pentium's floating-point bug was a major topic of heated discussion at year's end, it seemed to do little to weaken Intel's supremacy in the CPU marketplace. Nor, at least according to Grove's own comments, were the incursions of upstarts AMD, Cyrix, and others causing much of a problem.

Far from complacent, however, Grove aggressively pushed Intel into a variety of other ventures, perhaps the most visible of which was a network-based news-on-demand collaboration with CNN.

Jeff Hawkins
Chairman

Donna Dubinsky
President and CEO
Palm Computing



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Team OS/2: The Salmon-Shirted Ninjas Of COMDEX

Reader Carl Camera writes:

"I nominate 'Team OS/2.'

"Who's Team OS/2? Mostly non-IBMers who volunteer their own time and money promoting OS/2 to friends, family, strangers! There's no entrance fee—no meetings—no secret handshake. Just folks who promote OS/2 as a viable PC platform.

"I am an IBM employee, but I'm the exception in Team OS/2. Most Teamers are not IBM employees.

"IBM publishes a monthly newsletter (distributed on CompuServe) where Teamers report on product demos and exchange hints and tips with each other. There are more than a few Team OS/2 members outside the US, reaching as far as Russia and Australia, Singapore and Denmark. What ties us together is OS/2."

Camera forwards this COMDEX report from Teamer Keith Wood:

"This is the fifth COMDEX to be visited by Team OS/2 members in their distinctive shirts ('Don't call them pink—they're *Salmon*!'), and their enthusiasm has increased with every show. Teamers have been covering the convention sites supporting exhibitors who are interested in running OS/2 in their booths.

"Though there is no money in this, Teamers' experiences are worth millions—for instance, Teamer Dick Krueger was standing behind the crowd at the Warp demo booth when he discovered that he was next to none other than Bill Gates! The MS head was concentrating on the demo, and left before Dick had a chance to offer to help Bill get Warped!"

The well-balanced management team of Hawkins (the leading force behind GRiD's pen-based products) and Dubinsky, a veteran of high-level management at Apple and Claris, has been instrumental in ensuring that the fledgling Palm has not been one of the casualties of the often-disappointing PDA market. By finding successful niches in the PDA market (including PC connectivity and the innovative and hotly debated Graffiti, which, as they point out, is *not* handwriting recognition), they're keeping the company healthy while continuing development for the bigger things that lie ahead in mobile computing.

Dewayne Hendricks

Tetherless Access

President

"Dewayne," writes one of our readers, "has picked one of the hottest markets around and is up against the odds with the FCC trying to change the rules of the game in favor of big companies."

He's referring, of course, to the recently started auction of previously unlicensed frequencies of the radio spectrum, and the fact that Hendricks's company had built quite a nice product line, some of which takes advantage of this part of the spectrum. As a result, Tetherless was of great interest to community nets—for instance, rural communities seeking to use radio to bypass the high cost of phone service and access the Internet in an affordable fashion, with wireless technology merged with TCP/IP connectivity.

Hendricks appears unfazed by this development, however; he was active on the Net a good twenty years before it was fashionable and has the expertise to navigate its sometimes treacherous waters and build useful connections.

Mark B. Hoffman

Sybase

Chairman, President, and CEO

With the recent acquisition of tool-builder Powersoft, Hoffman's beefed up Sybase's strength on the client side of the client-server computing arena to complement the company's strength in server technology. The company continued to grow and prosper in 1994 on a number of fronts, and announced that it would be providing software for Scientific Atlanta's PowerTV set-top boxes.

Dave Hughes

Old Colorado City Communications

As the most visible spokesman for a distinctly populist brand of electronic democracy, Hughes has long been exploring the advantages of packet radio as a medium for low-cost telecommunications. He was predictably and vociferously incensed at the FCC's auction of previously unlicensed radio spectrum frequencies; however, the same determination that led him to hire Russian programmers to write custom software to be implemented in community networks in Latino and Native American towns in the Southwest will probably lead to some ingenious fix.

Reed Hundt

Federal Communications Commission

Chairman

Depending on who you listen to, the current radio spectrum auction over which Hundt is presiding will be either the making or the death of Access For The Rest Of Us, but after a year in office, Hundt is doing a creditable job of trying to balance the demands of his varying constituencies. The most formidable task facing him is creating a livable regulatory climate, as telcos, cablecos, online services, satellite providers, and others, with their attendant morass of conflicting rules and overlapping agencies, clamor for a level on-ramp to the info highway.

Steve Jobs

NeXT

Chairman

Confounding the prognosticators of doom, Jobs has not only managed to keep NeXT going in the aftermath of the wrenching decision to jettison the black workstations and focus on systems software, he's actually managed to find a pretty successful, if less glamorous, niche. Having won acceptance for NeXTstep not only in the Intel arena but with former arch-rival Sun, Jobs is benefiting from ongo-

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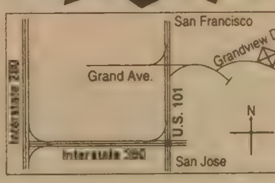

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- True 600x600-dpi resolution, combining Resolution Enhancement Technology (RET) and microfine toner
- 45 internal scalable typefaces plus 35 adobe™ Type I Typefaces
- Networking and sharing versatility with an HP JetDirect card and more!

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HP DESKJET 1200C/1200C PS PRINTER

- 600x300 dpi black text with Resolution Enhancement Technology
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- 2MB Memory standard
- 100 sheet multipurpose and 250 sheet tray
- 45 scalable fonts

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HP LASERJET 4M PLUS PRINTER

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- 6MB Memory standard
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- 26 built-in scalable typefaces
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- 300x300 dpi with further refinement by HP Resolution technology
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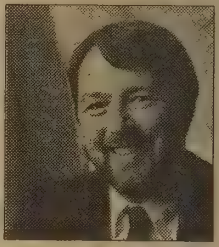

BMUG cofounder Jones and GRiD veteran Lefkof have built the company's early advantage in Macintosh networking (where it continues to enjoy a market share of around 60%) into a formidable presence in networked computing. During 1994 they established a strong presence in the Ethernet world with EtherWave, an unprecedented plug-and-play 10BaseT link that's garnered many honors both on Mac and PC; additionally, they achieved significant acceptance for Replica, their document-sharing software that competes with Adobe Acrobat.

Brewster Kahle
Wide Area Information Servers, Inc.

President and Chief Technical Officer

Kahle is the inventor and architect of WAIS, Wide Area Information Servers, a remote search and retrieval resource for networks such as the Internet. Kahle sees computer networks pushing a quantum leap forward in communication, in which everyone can be both publisher and consumer of ideas and information.

Now at WAIS, Inc., which he cofounded after working at Thinking Machines, Kahle is developing ways to improve access and retrieval of published documents on the Net. WAIS, Inc.'s customers are as diverse as Net users, including the Government Printing Office, the World Bank, Sun Microsystems, Fujitsu, Dow Jones, and the Encyclopaedia Britannica.

Philippe Kahn
Borland International

Chairman, President, and CEO

It was a tough year for many

continued on page 155

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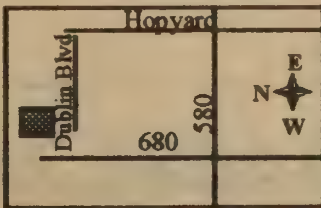

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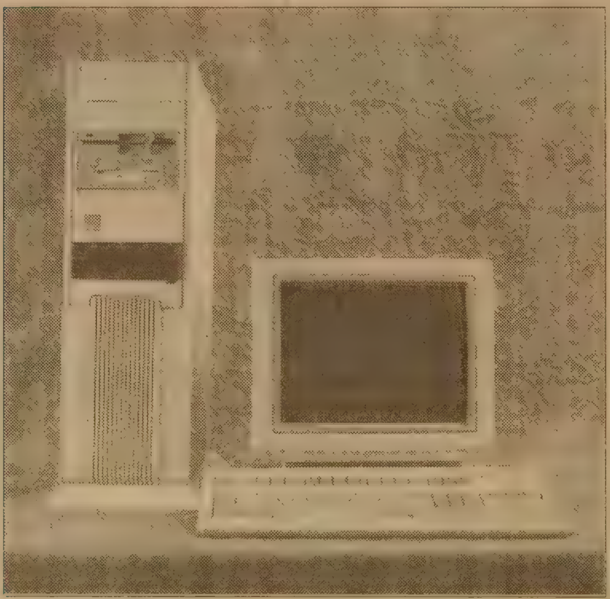

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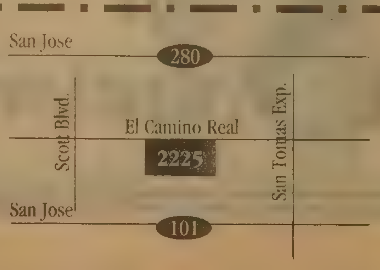

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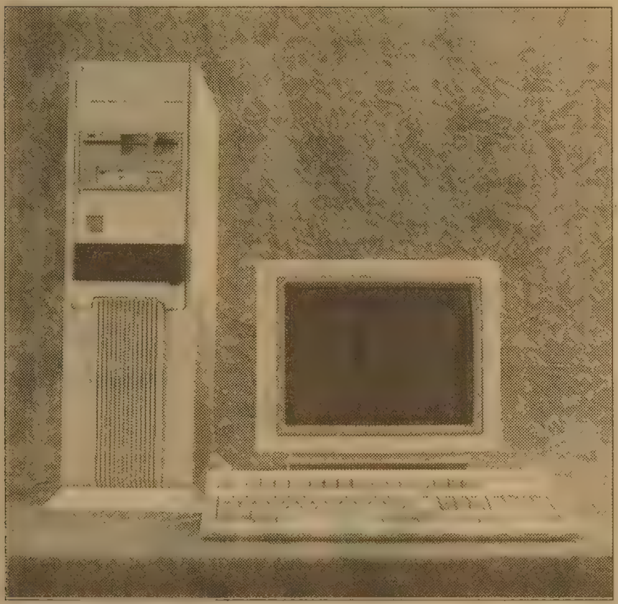

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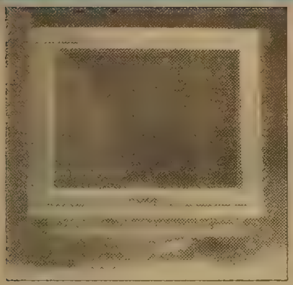

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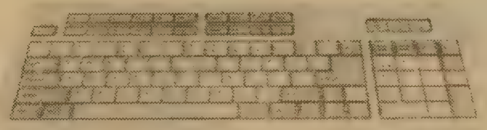

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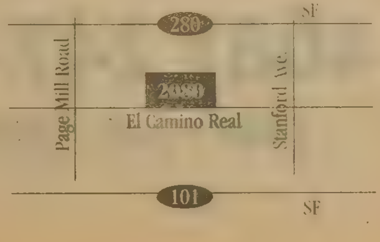

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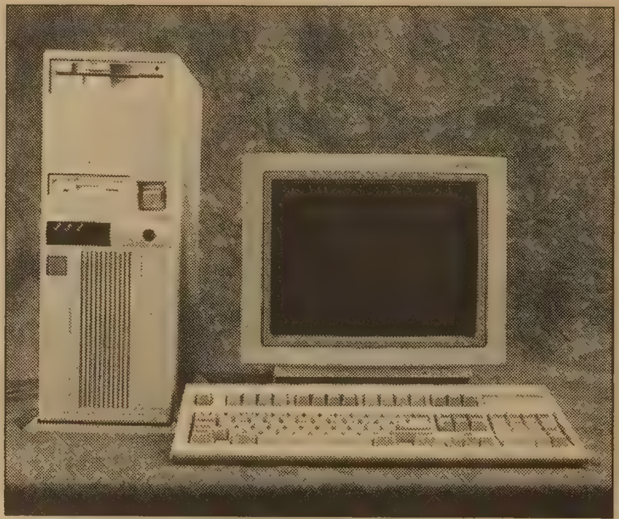

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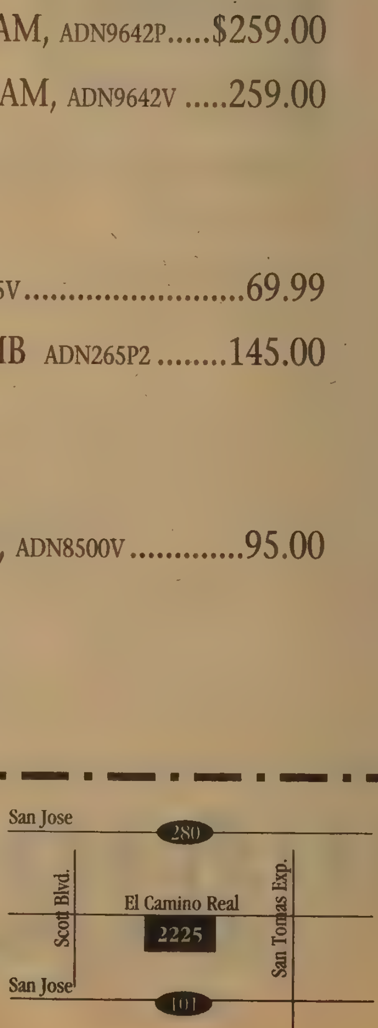

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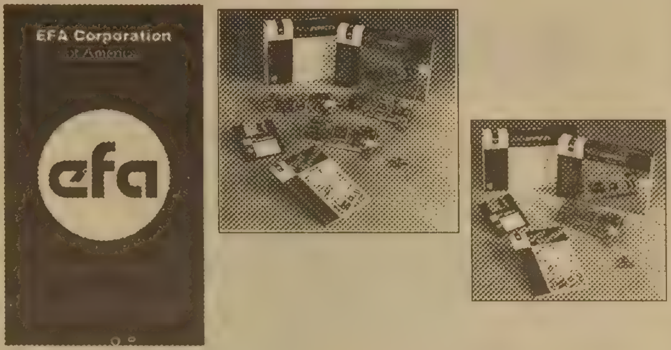

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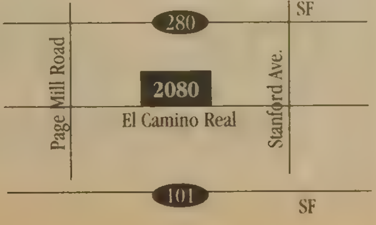

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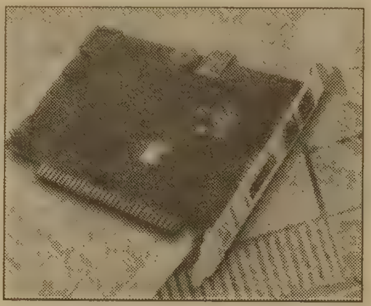

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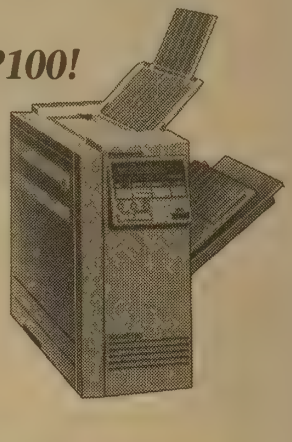

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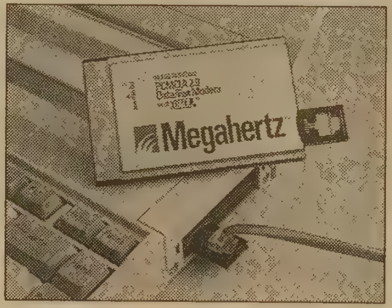

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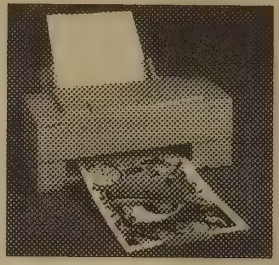

- 720x360 dpi w/ smoothing
- Color Advisor stationary store software
- High capacity ink cartridge
- 20 scalable fonts
- Lower cost of 14¢ per page

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BJ-230 110 column	389.00
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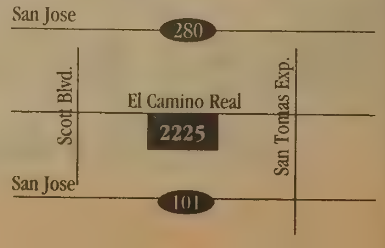

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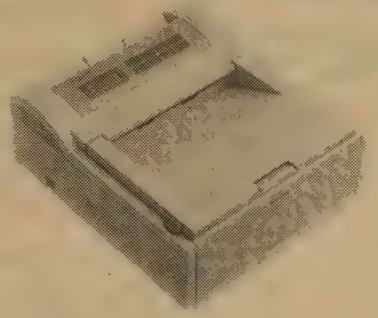

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- 5 year printhead warranty

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- 600 dpi class output
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- Postscript for Mac or PC
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OL410e 600dpi class................................$649

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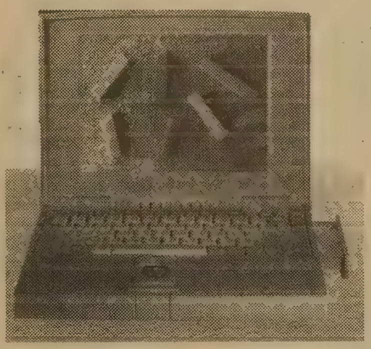

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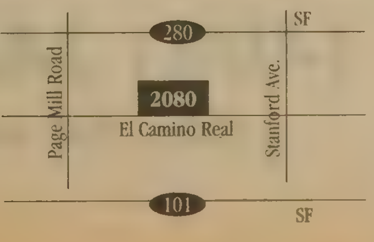

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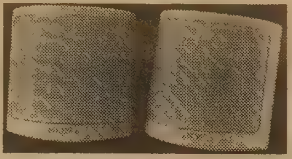

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GDM-15sf
15" Trinitron Display

- 14.0" Max viewing area
- .25mm dot pitch
- 1280x1024 resolution
- 50-120Hz refresh rate
- 3 year warranty

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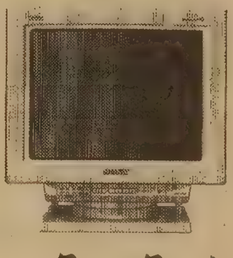
SONY



CPD-1320
14" Trinitron Display

- .25mm dot ptich
- 640x480 resolution
- 60-70Hz vertical freq.
- Analog RGB Input

Best Buy!

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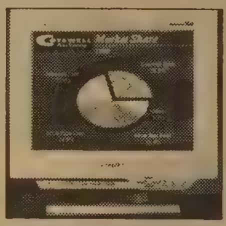
SONY *New!*



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17" Trinitron Display

- 16.1" max viewing area
- .25mm dot pitch
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- 1280x1024 refresh rate
- 3 year warranty

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- 1MB RAM
- PCL-5

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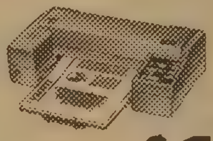

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LX-300	$ 169.00
FX-1170	369.00

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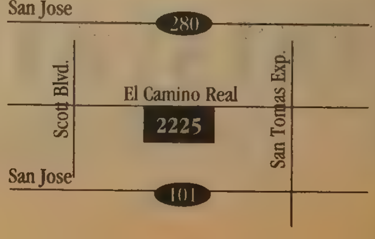

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- IDE interface included

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- 600KB/sec transfer rate
- 220ms access time
- 256KB cache

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4Xi w/ MS Encarta & IF 449.00

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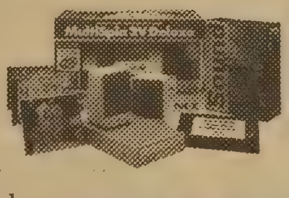

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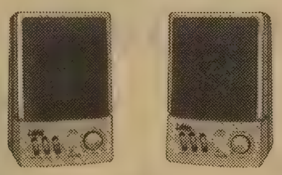
Labtec



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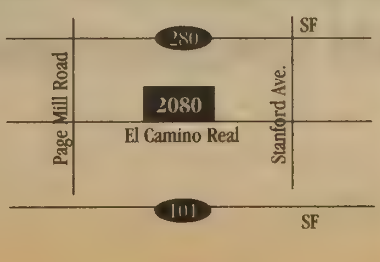

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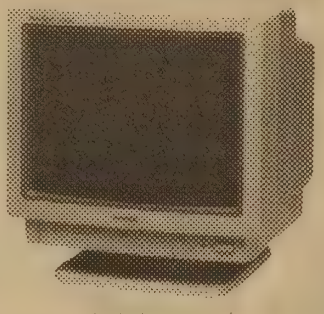
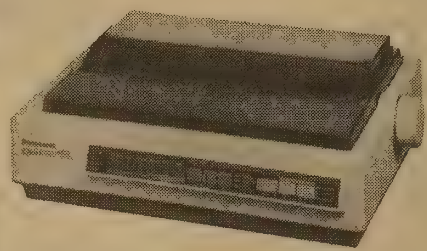


- 1280 x 1024 resolution
- Large 19" viewing area
- 0.31mm dot pitch
- 50-90Hz vertical refresh
- Mac and PC compatible

$899*

**Remanufactured monitor w/ full factory warranty*

KX-P2123 24-pin Quiet Printer

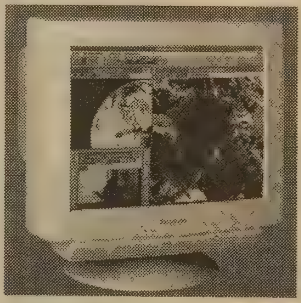


- Fast 240cps speed
- 6 built-in fonts
- 2 year warranty

$149*

KX-P2023 ....$149*

**Remanufactured printer w/ full factory warranty*



PanaSync 1791E
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New!

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- 1280x1024 max resolution
- 0.28mm dot pitch
- AR-coated flat & square screen
- Auto-switching Universal Power Supply

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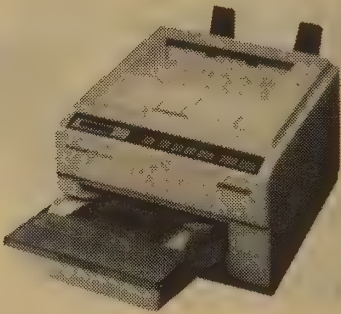
KX-P4410 Laser Printer

ideal Personal Printer



- 5 ppm printing speed
- 300 x 300 dpi
- 512K exp to 4.5MB
- 200-sheet paper tray
- HP Laserjet emulation

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Hiper 14.4 V.32/V.42 Int ADC1414H	89.00
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Panasonic KX-P4410 4PPM laser 2nd Inv.	389.00
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SpectraStar Hi-Res Color Thermal PTG430	3599.00
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Media Vision RENO Premier Kit HDM4000	469.00
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SONY I/F & Cable for CDU7205 HDS7205I	29.00

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Keyboard Drawer XSP014	12.99
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NEC MultiSync® Monitors

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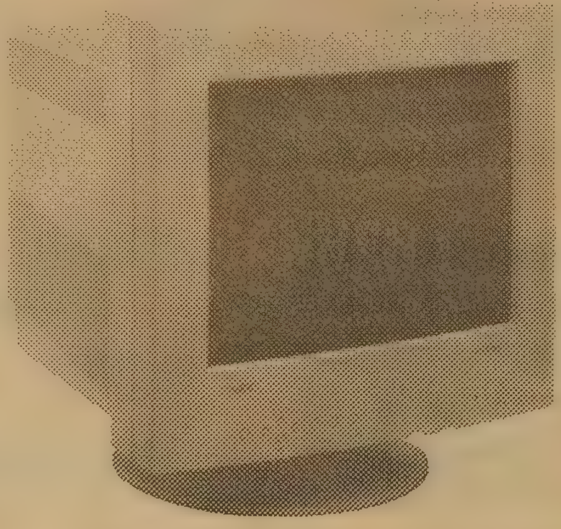

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- 260MB hard drive
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- SurePoint™ mouse
- 3 Years Standard Warranty
- Other models available

Best Selling Color Notebook!

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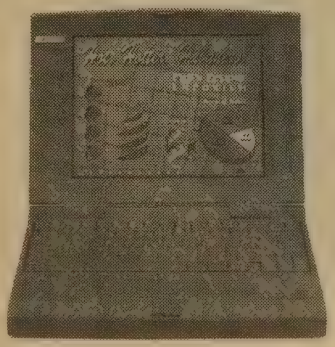
Versa® V *486DX2-50 Color Notebook*



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- 540MB hard drive
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- TFT Active Color Screen
- Front mounted VersaTrack trackball
- Weighs less than 7 lbs.
- 3 Years Standard Warranty
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Powerful, Modular Multimedia-Ready Notebooks!

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- Multimedia ready
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CPU	HD	Full Color	Hi-Res
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DX4-100	810MB	$5599	$5999
DX4-100	540MB		$5599

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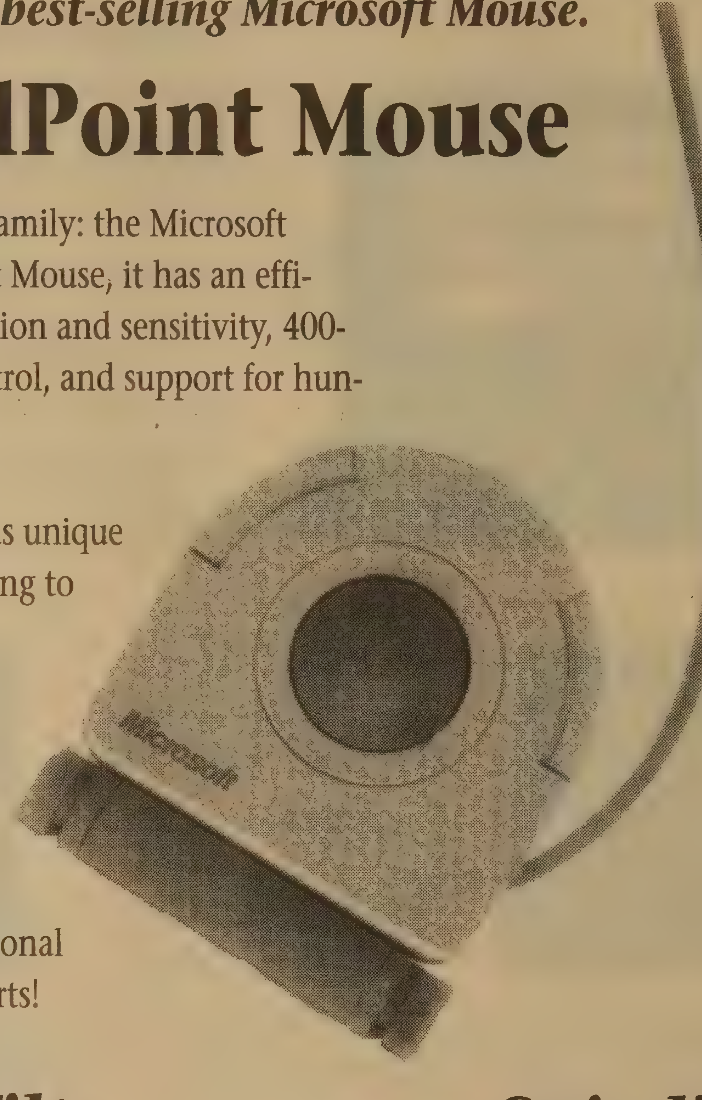
Microsoft® Mouse

Created for notebook and desktop computers, the Microsoft Ballpoint mouse has a revolutionary design that's ideal whenever space is at a premium. Set it next to your keyboard and get the same high resolution performance as the best-selling Microsoft Mouse.

Microsoft® BallPoint Mouse

Meet an exciting member of the Microsoft family: the Microsoft Ballpoint mouse. Like the popular Microsoft Mouse, it has an efficient ergonomic design, adjustable acceleration and sensitivity, 400-points-per-inch resolution for pinpoint control, and support for hundreds of applications.

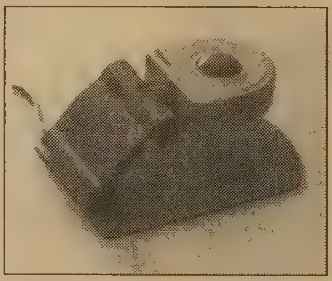


But just one look will tell you this mouse has unique advantages. It brings mouse-driven computing to your computer. Set the mouse to the left or right - whatever you prefer. The Ballpoint mouse can also be lowered, swiveled in, out or up to maximize the comfort of your hand.

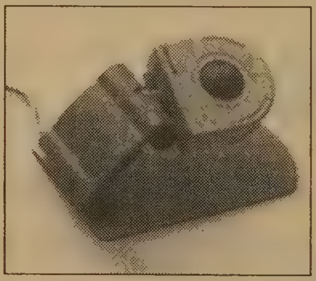
The Microsoft Ballpoint mouse: It's a sensational innovation from Microsoft, the mouse experts!

Ready...

Tilt...



Swivel!



Microsoft® *BallPoint Mouse*

$14.99

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Microsoft

continued from 140

of the software giants, and Borland was no exception. Always one of the industry's more colorful figures, Kahn was often downright subdued in 1994, though he managed to stymie a shareholder coup intended to remove him from office. The long-awaited Windows versions of dBASE and Paradox arrived just in time to plunge Borland into a ruinous pricing war in the cutthroat applications marketplace, and Kahn began the arduous process of what he called "reengineering Borland." Key emphasis of the new strategy is "upsizing," migrating customers from desktop databases to connectivity with larger client-server solutions. Borland envisions a new niche as the "Switzerland of tools" in the database market, as moves like Sybase's acquisition of Powersoft cause some customers to seek vendor-independent solutions.

Mitch Kapor

Chairman, Cofounder

John Perry Barlow

Cofounder, Member
Board of Directors

Electronic Frontier Foundation

It's been kind of a tough year in Washington for the "odd couple of cyberspace" as the civil liberties organization hit the Congressional wall, achieving minor victories in Clipper legislation and drawing howls of anguished protest for its equally anguished decision to support the version of the Digital Telephony bill that eventually became law. However, given that massively diminished hope in Washington was a fairly recurrent theme during 1994, it remains to be seen whether EFF fares better or worse under the new Congressional order; one of the organizations' main strengths is its founders' fairly unique door-opening and networking abilities in diverse worlds, and in the current situation Barlow's status as a former county chairman for the Republican party couldn't hurt.

Roger Karraker

Santa Rosa Junior College
Instructor

Karraker's efforts to acquaint his journalism students with the world of online communications had a profound, if infelicitous, effect on BBSing in the schools (see story in Year In Review section). For stalwart service and determination to do the right thing in the face of severe adversity, he's the recipient of this year's grace under pressure award. With Oak Leaf clusters.

Robert Kavner

Creative Artists Agency
Business Affairs

A proponent of the importance of content during his successful sojourn at AT&T, Kavner still surprised many when he left the telco giant for showbiz. Bringing his expertise about the conduit side of the business to this top-flight talent agency, he's a key figure in facilitating the convergence of various industries which have operated under vastly divergent cultural and business models, and whose collaboration is vital for promising technology to become a viable business.

Kevin Kelly

Wired

Executive Editor

The tension between style and substance is part of the very DNA of *Wired*, where Marshall McLuhan is the patron saint and the medium is quite definitely a big part of the message.

Kelly is definitely one of the forces for substance. One of the computer world's more independent thinkers, he's also the author of *Out of Control*, a book in which he explores some of the deeper implications of the technology with which we're becoming interdependent.

Bruce Koon

Marcelo Rodriguez

San Francisco Free Press

Founders

San Francisco's newspaper strike catalyzed the rapid (and unexpectedly early) deployment of online publishing tools, at a time that coincided fortuitously with the release of Netscape's Web browser. In what's sure to figure as a pivotal moment in the history of publishing, Koon and Rodriguez set up a page on the World Wide Web in which print-deprived readers could access highly topical columns by striking writers newly freed from the constraints of column inches.

The resolution of the strike sent the Freep files to the archives before its possibilities as a commercial venture had been seriously explored, but the fact that it was accessed a quarter of a million times during its brief existence on CCnet suggests that there really is an audience for this sort of thing.

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- Microsoft Compatibel Mouse + Pad
- **DISCOVERY CD 16 Kit**
  - Double Speed CD-ROM
  - Sound Blaster 16
  - Speakers + 15 CD title

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Intel PENTIUM-66/256K PCI	1,723
Intel PENTIUM-60/256K PCI	1,625
486DX2-66/256K VLB	1,221
486DX-40/256K VLB	1,175
486DX-33/256 VLB	1,140
486SLC2-66/64K VLB	1,123

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Intel PENTIUM-60/256K PCI	275	663
Genoa 486DX2-66/256K VLB	109	290
Genoa 486DX-50/256K VLB	109	294
Genoa 486DX-40/256K VLB	109	264
Genoa 486DX-33/256 VLB	109	209
486DX2-66/256K VLB+PCI	109	291
486DX-50/256K VLB+PCI	109	341
486DX-40/256K VLB+PCI	109	264
486DX-33/256 VLB+PCI	109	209
486DX2-66/256K VLB	81	271
486DX-50/256K VLB	81	320
486DX-40/256K VLB	81	224
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486SLC2-66/64K VLB	N/A	149

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- 210 MB Fast IDE HD
- 512 K Trident SVGA
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- Mini Tower Case w/230W P.S.
- 101 keyboard
- Microsoft Compatible Mouse w/ Pad

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486DX-33/256 VLB	828
486DX2-66/256K ISA	900
486DX-33/256K ISA	808
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540 MB	85	Full Tower Case	40
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15" Monitor	100	Power Surge	17
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MAXTOR 540 MB IDE	230
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CONNER 420 MB IDE	187
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CONNER 540 MB SCSI	285
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Adaptec SCSI 1542 OEM/1542 w/kit	168/245
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Bill Lockyer

State Senate, California
President Pro Tem

Thanks to Lockyer's appreciation of the benefits of technology, all senators will henceforth have an IBM ThinkPad on their desks when they're in session, in order to be able to instantly access the text of bills under consideration, as well as supplemental materials. Aside from the benefits from better access to information, this paradigm shift is expected to save the taxpayers considerable printing costs as the computer system replaces tons of paper generated in the course of legislative business.

Gilman Louie

Spectrum Holobyte
Chairman, Chief Technical Officer, and Strategic Development Officer

Louie's kept Spectrum in the forefront of the gaming world, as it successfully completed a merger with rival MicroProse to become the undisputed leader in the flight simulator arena. With Paramount as one of the company's chief investors, Spectrum was also planning a big holiday season as the exclusive licensee of a variety of Star Trek: The Next Generation and Generations products.

Tom Mandel

Philip Elmer-DeWitt

Forum Leaders
TIME Online

Almost from the beginning of online services, magazines have been trying to figure out what to do with the medium. Most online versions of magazines have turned out to be pretty dismal, often consisting of recycled stories and the occasional email address.

RI futurist Mandel and *TIME* correspondent

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OUR CHILDREN, OUR FUTURE

Elmer-DeWitt brought long online experience to the design and management of this forum, which no less a pundit than John Dvorak pronounces one of two online magazines that are any good (the other being Mercury Center). They promoted a high level of interaction between readers and *TIME* staff, and made sure there was a lot of value added—from stories that didn't make local print editions to noteworthy events like the appearance of evangelist Billy Graham in a real-TIME chat drawing thousands of participants.

Some comments from TIME Online participants:

- "When you visit there expecting good conversation, you are rewarded."
- "Tom has encouraged the *TIME* editorial staff to participate...and...with enthusiasm.... Much of the draw for the TIME Online experiment is created by their presence."
- "They really showed other magazines how to go online."

Jim Manzi

Lotus Development

President and CEO

The transition's often been painful (1994 saw some whopping losses), but Manzi's been highly effective at redefining Lotus as its spreadsheet business wanes. Both Notes and cc:Mail occupy leadership positions in enterprise computing, enabling global collaboration of ever-increasing speed and efficiency.

In the current climate, in which Lotus's chief competitors are busily acquiring and consolidating their way to what they hope is world domination, these two prize applications (not to mention the relatively low stock price) are also serving to make Lotus an attractive takeover candidate. At press time, AT&T and Oracle were rumored to be among the suitors, but Manzi wasn't talking.

Harry Marshall

Silicon Video

Chairman and CEO

Flat-panel display technology (or rather, Japanese ownership of most of the key patents) has been a major bugaboo to the US computer industry. The good screens, based on active matrix LCD technology, add significant bulk and weight to portable machines, to say nothing of representing a major portion of the unit's cost.

All that may be about to change. Silicon Video

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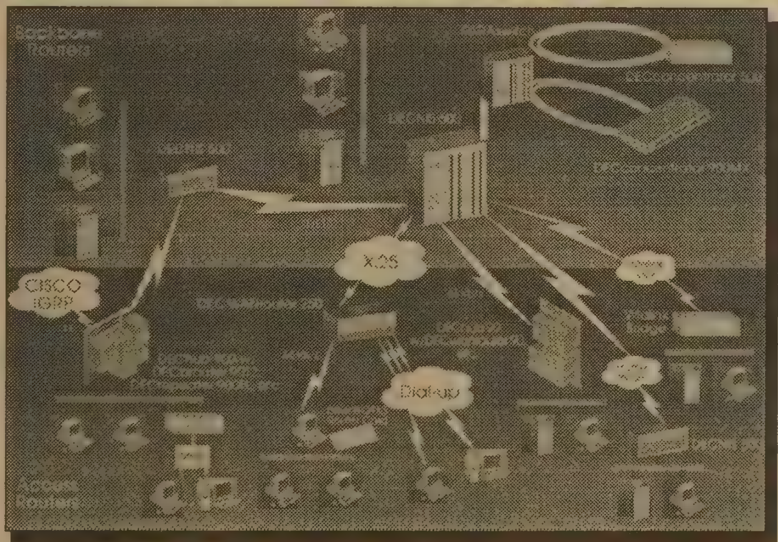

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made headlines in 1994 as the recipient of a rar $22 million grant from the federal Technolog Reinvestment Program to enhance its work o "thin CRT" technology, a lighter, cheaper, and les power-hungry alternative to active matrix LCD.

Marshall's task is to coordinate the variou efforts it takes to transform breakthrough technology into a winning product and company. Wit investors and technology partners includin Compaq, Hewlett-Packard, and the Department o Defense, Silicon Video (which is still at least a yea away from shipping its first product) offers industry-changing possibilities.

Craig McCaw
Investor

Others might go into comfortable retirement afte deals like the one in which McCaw sold McCa Cellular Communications to AT&T, but communications czar McCaw seems intent on still bigge things. The largest single shareholder of AT&T stock as a result of that deal, McCaw is als involved in a Teledesic, satellite-network collaboration with Bill Gates, and was recently a relentles bidder in the FCC's frequency auction.

Ed McCracken
Silicon Graphics
CEO and Chairman

McCracken has kept SGI at the forefront of 3D-workstation technology, while expanding its efforts into new markets and maintaining health profits. The company's coped gracefully with i acquisition of Mips, a move many thought would b its undoing. Further, McCracken has entered int joint technology ventures with partners fro Nintendo to Time Warner, developing gam machines, set-top boxes, and other consumer devic well outside its traditional markets.

McCracken also plays a politically strategic role fo the industry, serving as cochair of the President National Information Infrastructure Adviso Council.

Art McGee
Online Activist

McGee works at the Institute for Glob Communications as a user support person and th coordinator of Black and African networking. Th Los Angeles resident has achieved global respe maintaining a wealth of information on issues

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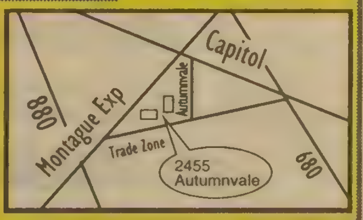

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particular interest to Black and African people throughout the world.

Says McGee: "My basic message is that this medium has incredible potential to empower those that have traditionally had technology used against them, and can break down many of the current rigid hierarchies of news and information dissemination. This is especially important to Black, African, and other people of color, because it can give us more control over what people know about us and help us to find more of what we need to know."

Scott McNealy
Sun Microsystems
Chairman, President, and CEO

McNealy had to engage in some serious price-cutting on desktop workstations in his efforts to keep Sun at the top of the heap, and there was some hilarity in the industry when Sun entered into a technology agreement with once-hated NeXT. But it was all for a good cause as Sun remained the undisputed market leader and its networking capabilities served it well in a world of ever-more-connected computing.

John Moussouris
MicroUnity
Chairman and CEO

Former Mips vice president of R&D Moussouris has remarked that connectivity, in the sense of allowing people to communicate with each other, is going to be a far more important industry than the digital conveyance of content. With that in mind, and with investors like Microsoft (to the tune of $15 million) and TCI (ditto), Moussouris' company has set out to resolve the bandwidth problems of the information highway with a "media processor," a chip designed for communications rather than computation.

The chip will be software-programmable and hardware-independent, something that dovetails nicely with Microsoft's emerging strategy for online video-on-demand, and will run several hundred times faster than a Pentium.

John Norstad
Northwestern University

Long beloved for his ongoing work on the free anti-virus program Disinfectant, Norstand won

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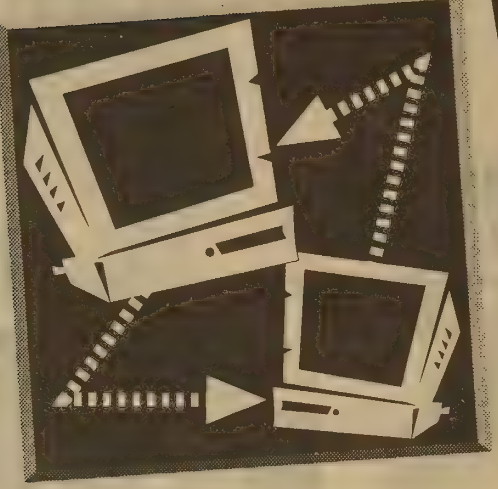

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new fans in 1994 with NewsWatcher, a Macintosh-based program that makes it easy to read Usenet newsgroups.

Robert Palmer

Digital Equipment Corporation

Chairman, President, and CEO

Although the effect of the TV advertising blitz on DEC's market share remains to be seen, it's clear that Palmer is achieving noteworthy results in reversing the company's downward trend. He's streamlined operations relentlessly, stressed the technical advantages of the proprietary Alpha chip, and gone after Digital's long-lost place on the PC desktop. With a historic strength in networking, the company will have some strategic expertise as the communications and online transaction markets grow.

Eckhard Pfeiffer

Compaq Computer

President and CEO

When Pfeiffer announced Compaq's goal of surpassing IBM in global PC market share by 1996, he encountered plenty of skepticism. But by virtue of aggressive cost-cutting and nimble adjustment to changing markets, he's won over customers in the corporate and consumer marketplace. By endorsing AMD's technology for Compaq's products, Pfeiffer also gave a boost to the alternative vendors in the x86 CPU industry.

As for IBM, his prediction was off. Compaq became the world's leading PC supplier two years early, in 1994, overtaking IBM. It also passed Apple to take the leading position in US market share.

Lewis Platt

Hewlett-Packard

Chairman, President, and CEO

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Atiq Raza

NexGen

President and CEO

Taking an entirely different approach to the x86 standard, Raza's company, whose investors include Compaq and Olivetti as well as some blue-ribbon VCs, has developed the Nx586, a revolutionary RISC-based and fully Pentium-compatible processor. Raza claims that his chip's architecture bypasses the problems leading to the much-ballyhooed Pentium floating-point bug, and cracks, "I wouldn't believe a business plan that's been put together with a Pentium."

Time will tell—NexGen's floating point model, much tested, is due in the first quarter of 1995.

Howard Rheingold

Author

Rheingold's book *The Virtual Community* reached a new audience as it hit paperback shelves, and his paisleyed presence appeared on TV shows and magazine covers around the world, expounding the human side of all this Internet stuff. He also made new inroads into the text world with "Tomorrow," a nationally syndicated column full of Rheingoldian reflections on technology.

Jack Rickard

Boardwatch

Editor

Like the BBS world it covers, *Boardwatch* is a lot bigger and better known these days. Between the magazine, the veritable Bible of the online world, and the ONE BBSCON conference, which has finally outgrown Colorado Springs and moved to Atlanta, Rickard wields major influence in the BBS world, supporting friend and taking on foe with equal enthusiasm.

Tom Rielly
Karen Wickre

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Rielly and Wickre (he started out with SuperMac in the startup days, did a three-year PR stint at Farallon, and is a founding member of the American Film Institute's Advanced Technology Council; she's currently with Ziff-Davis writing a book about the World Wide Web and serving as managing editor of a forthcoming book called *CyberSource*) cofounded Digital Queers to raise money for gay, lesbian, bisexual, and transgender community organizations.

It's also, they say, a great forum for social and professional networking, and has a strong online presence on AOL. They claim their parties are the best at Macworld; in any case, DQ combines the fun and the socially useful for its many members and beneficiaries.

Jerry Rogers

Cyrix

President and CEO

Rogers continued to nip at Intel's heels during 1994 with Cyrix's alternative 486 technology, which found acceptance among many PC vendors, including AST Research, looking for advantages like increased speed, and reduced heat generation and power consumption. He also entered into an agreement with IBM for the latter to manufacture Cyrix's most advanced chips at its state-of-the-art facilities. Cyrix's next-generation technology, the M1, unabashedly billed as "the fastest x86 CPU for PCs," is due to enter production in early 1995; Rogers, meanwhile, is looking beyond the x86 standard for opportunities to diversify the company's product line.

Heidi Roizen

T/Maker

President and CEO

In June of 1994 Roizen and partner Royal Farros, reflecting a characteristic trend of small software companies during the year, sold their company, in this case to check-printing giant Deluxe. However, Roizen insists that T/Maker has gained a deep-pocketed and well-allied partner rather than lost its wacky soul, and stands to gain access to some new and lucrative markets as a result. With successful product lines in the ClickArt series and the new VroomBook CD-ROMs for children, as well as collaborative ventures from kiosks to cable TV licensing, the Mountain View company has no shortage of opportunities if it can keep its vision intact.

Paul Saffo

Institute for the Future

Research Fellow

Saffo is an influential provocateur who's not above spinning apparently farfetched scenarios to stimulate discussion and new ideas about technology and its implications for the rest of human activity. His particular interest in the convergence of communications and technology made him one of the most insightful analysts of the year's explosive growth and change in those areas for the business and technical communities.

W.J. Sanders, III

Advanced Micro Devices

Chairman and CEO

"The benefits of Moore's Law tend to reach the consumer more rapidly in the absence of a monopoly," says Sanders in what he describes as his corollary to the maxim of Intel's chairman. 1994 was a good year for Sanders and AMD, as they fared reasonably well in court against Intel and scored points with Compaq's endorsement of their technology in its hardware line.

Richard Schulze

Best Buy

Founder, Chairman, and CEO

Schulze originally launched his consumer electronics empire in Minnesota in 1966 with a speciality in audio components. From that beginning he expanded into other areas of mass merchandise, including personal computers; from an unpromising beginning along those lines (his first product line featured blockbusters like Amstrad and Commodore) he built up a take-no-prisoners company with efficient, brand-oriented merchandising, aggressive pricing, and a strategy of saturating geographic areas with outlets. The fall of 1994 saw the advent of the first seven Best Buy outlets in Southern California; twelve more are scheduled for 1995, adding to the competitive environment that's already slowed the momentum of superstore CompUSA.

Neil Selvin

Global Village Communications

President and CEO

Selvin's built Global Village into a mainstay of computer-based communications, and the company's enjoying growth in a tough market as a result, becoming the number-one vendor in the Mac and OS/2 communications market. From the FaxWorks software family, which regularly turns up as a user favorite, to the OneWorld plug-and-play telecommunications servers, Global Village is making a good business out of making it easier for people to communicate.

Richard A. Shaffer

Technologic Partners

Principal

As editor of *Venture Finance* and *Computer Letter*, Shaffer is a vital and trusted information source for the investment community. For the last decade, his conferences, which center on technologies he considers especially interesting to investors, have been a mecca for entrepreneurs, venture capitalists, and miscellaneous movers and shakers to meet, greet, and launch a little company now and then.

Stan Shih

The Acer Group

Chairman

Departing somewhat from its core market in PC-compatible technology, Acer made headlines late in the year as the first licensee of Apple's Macintosh operating system. The resulting machines are slated for Pacific Rim distribution, and represent the sort of responsiveness to opportunity Shih has historically exhibited. In his recent efforts to make the Taiwanese giant more globally competitive, he's developed a strategy of localizing Acer's subsidiary companies and giving them more autonomy. His combination of Western entrepreneurial skills with traditional Taiwanese business practices have combined to make Acer an efficient, productive global company.

Michael Slater

Microprocessor Report

Publisher

When the Pentium's buggy, who you gonna call? *Microprocessor Report*, of course, where Slater and his well-informed, technically sophisticated contributors bring balance and perspective to the issue. In a fast-moving industry where today's state-of-the-art processor is next week's antique, *Microprocessor Report* is the indispensable reference for hardware designers.

Michael Spindler

Apple Computer

CEO and President

Spindler has pleased shareholders and customers by restoring Apple to profitability and competitiveness. The PowerMac transition is well under way as the new platform receives generally enthusiastic acceptance, and margin-cutting has resulted in Mac prices that have old-timers shaking their heads.

Another shock to Apple traditionalists was Spindler's announcement that Apple would begin to license the Macintosh operating system to other hardware vendors, raising the previously unthinkable spectre of Mac clones.

There are still plenty of unknown quantities at Apple, including the future of the Newton (which hasn't been nearly as well received as the PowerMac) and the eWorld online service, as well as other forays into the consumer marketplace. So far, however, Spindler's shown a much-needed blend of vision and pragmatism as Apple faces a new technological era where ease of use is only the beginning.

Robert David Steele

Open Source Solutions, Inc.

President

Former Marine and denier-to-the-death-of-CIA-employment Steele learned in the just-in-time intelligence world that timely information was worth a lot more than a belated exclusive. In the course of disseminating this principle around the world and holding a yearly Open Sources conference in Washington, he's developed a unique role as a builder of bridges between his erstwhile colleagues in the research and intelligence communities and the world of open sources information available on the Net.

This occasionally leads to misadventures, as it did in 1994, when Steele was accosted in his hotel room by FBI agents while attending the Computers, Freedom & Privacy conference in Chicago. Turns out, however, they were looking for some high-tech malefactor that didn't look a thing like him but went by the name of Agent Steel.

Donald Steinbrecher

Founder and Chairman

R. Douglas Shute

President and CEO

Steinbrecher Corporation

Steinbrecher, then a professor at MIT, founded the company in 1973 to work on issues related to high-performance radio frequency. Since 1988, under Shute's direction, it's focused on high-performance digital radio subsystems.

The company's developed flexible, relatively low-cost devices capable of handling broadband transmissions and changing frequencies as required. According to big Steinbrecher fan George Gilder, this technology stands to drive the cost of wireless communications down very quickly.

Team OS/2

The more things change....

Guy Kawasaki (never mind Steve Jobs) would no doubt be astonished at the transplantation of the fervor-and-zeal school of guerrilla marketing to IBM, but so it is. It remains to be seen whether this merry band of OS/2 enthusiasts will be as successful as their spiritual ancestors in Cupertino, but clearly (see sidebar) even IBM has discovered The Macintosh Way, or at least its higher precepts.

Glenn Tenney

The Hackers Conference

Chairman

For nine of its last ten years, Tenney (whose involvement with the personal computer industry goes back to 1976 when he cofounded a company called Software Technology Corporation) has chaired the Hackers Conference, an invitational event where distinguished innovators meet to discuss what they're doing with technology and what's next. Past visitors have included such pioneers as Doug Engelbart, Don Knuth, and Marvin Minsky; discussions range from high-bandwidth fiber networks to nanotechnology to K-12 education, and many projects (even companies) have had their beginnings here.

Tenney also made a respectable showing as a first-time Congressional candidate in 1992, scoring 11% of the Democratic primary vote after conducting his campaign almost entirely online. With former opponent Tom Lantos now making noises about resigning after his current term, it'll be interesting to see if Tenney hits the virtual campaign trail yet again.

Patrick Volkerding

Nexsys Electronics

Reader Jim Haynes nominates Volkerding as an example of the sort of ad-hoc cooperative endeavor that's enabled so much of our current technology to exist: "Patrick, in his spare time, is the producer of the Slackware distribution of Linux, the free UNIX look-alike developed by Linus Torvalds and a cast of, well, at least tens of people all over the world. Linux is by far the most popular of the available free 'UNIX' systems for the PC. One reason it is so popular is the ease of installation and getting started; and the main reason it is so easy is that Patrick and others like him have bundled up the work of those tens or hundreds of developers into a neat package that is easy for the novice to install.

"Patrick has produced a new release of his 'Slackware' distribution every few months. The distributions are available free of charge over the Internet, or at nominal cost on CD-ROM or maybe even on floppy disks yet.

"Because of his work we have the best of both the free and commercial

continued on page 200

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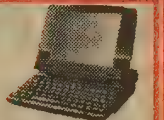

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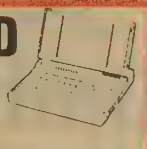

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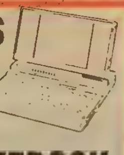

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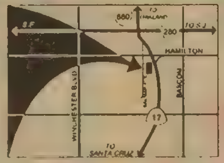
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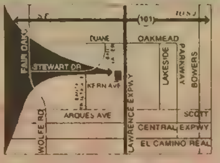
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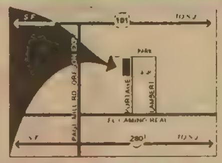
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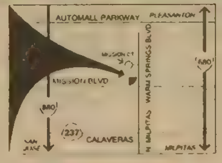
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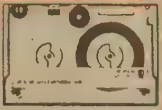

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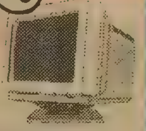

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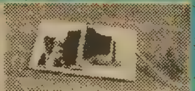

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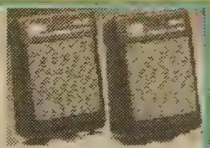

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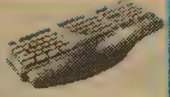

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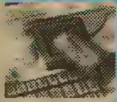

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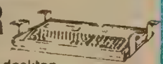

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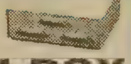

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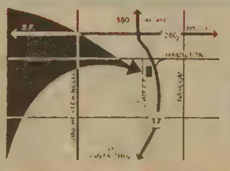

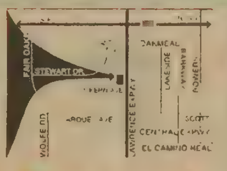

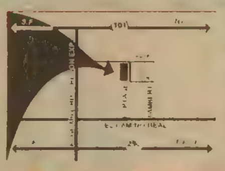

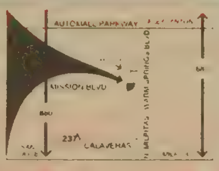

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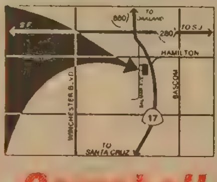

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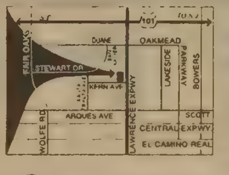

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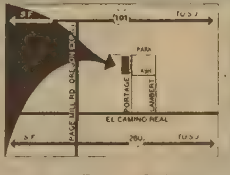

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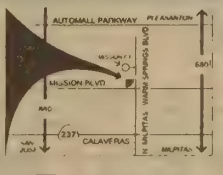

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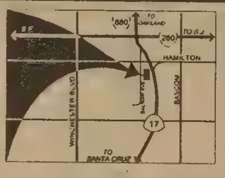

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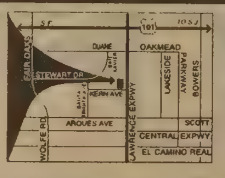

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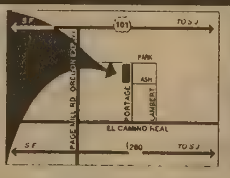

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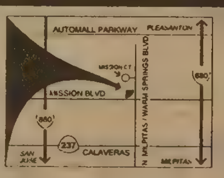

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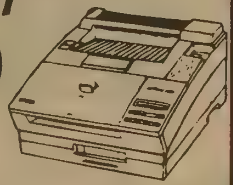

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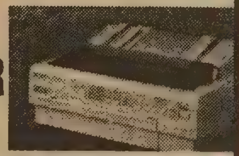

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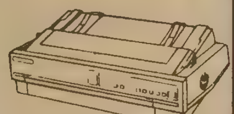

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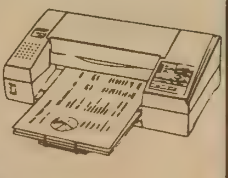

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- 200 CPS Print Speed

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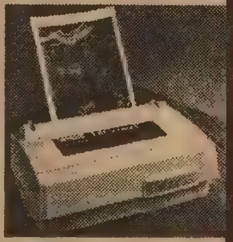

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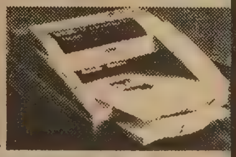

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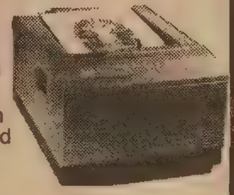

- 300 X 300 dots per inch
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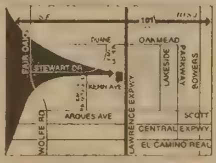
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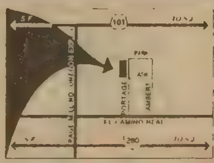
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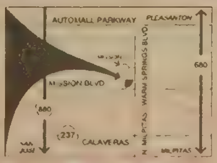
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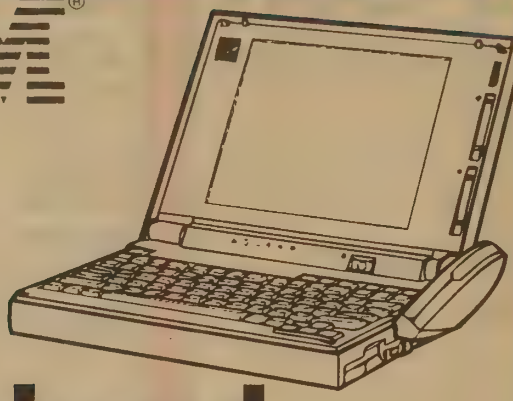

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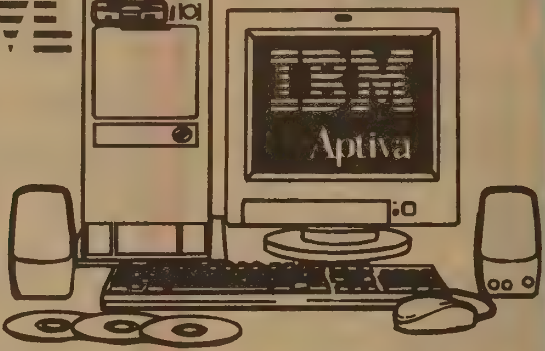

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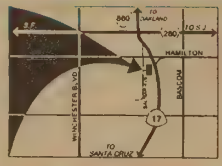
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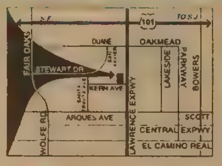
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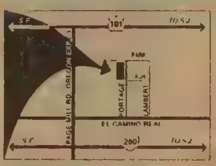
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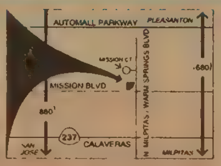
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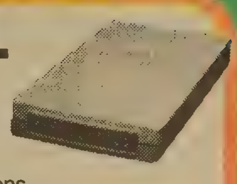

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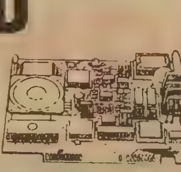

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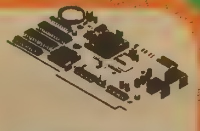

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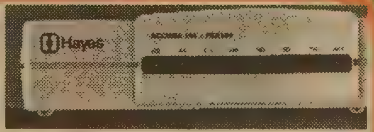

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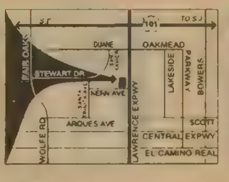
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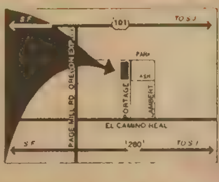
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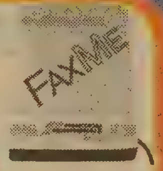

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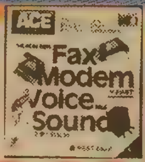
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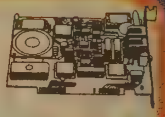

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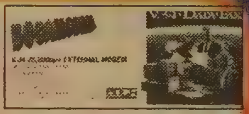

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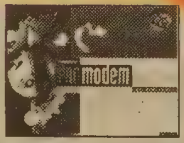

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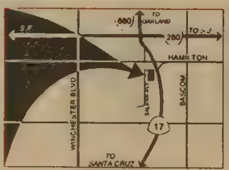
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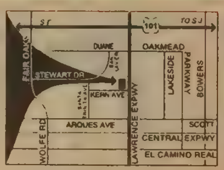
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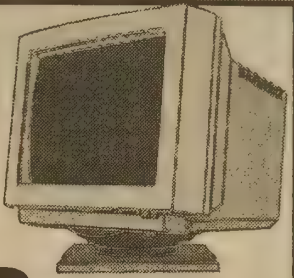
CDP-15FS 1280 x 1024 15" SUPER VGA MONITOR

15" 1280 X 1024 Resolution • Flat Trinitron Screen
Energy Star Compliant
#1928095

$414

NON-INTERLACED 1024 X 768 .28mm DOT PITCH 15" SUPER VGA MONITOR



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$287

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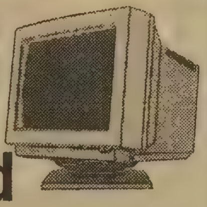

SuperScan™ 15s Non-Interlaced 1280 x 1024 15" SUPER VGA MONITOR

Non-Interlaced • .28dpi • Flat Screen
#1939376

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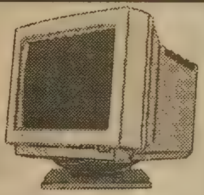

2V MULTISYNC 14" SUPER VGA MONITOR

1024 x 768 • Flat Screen • .28 dpi
Non-Interlaced
#1926185

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*After
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Rebate.
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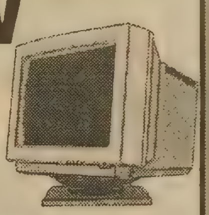
Price $317

NEC 3V



Non-Interlaced 1024 X 768 .28mm 15" SUPER VGA MONITOR

1024 X 768 • .28mm Dot Pitch • Non Interlaced
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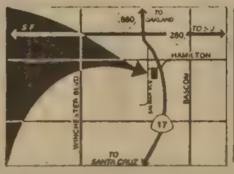
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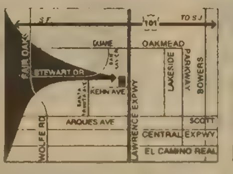
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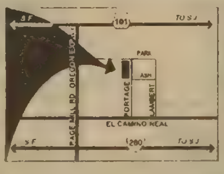
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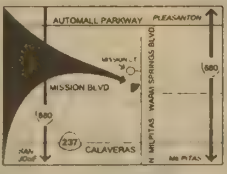
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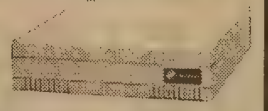
170MB EXTERNAL HARD DRIVE FOR MAC



MODEL 170
#1838592

NU DESIGN

$259

270MB EXTERNAL HARD DRIVE FOR MAC

MODEL 210
#1838628

NU DESIGN

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340MB EXTERNAL HARD DRIVE FOR MAC

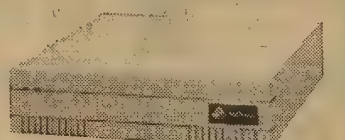
MODEL 340
#1850659

NU DESIGN

$349

540MB EXTERNAL HARD DRIVE FOR MAC

#1850671



NU DESIGN

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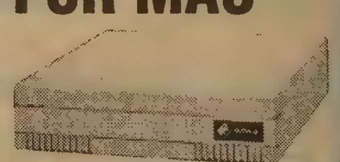
1.2 GIGABYTE EXTERNAL HARD DRIVE FOR MAC

MODEL 1.2
#1850682



NU DESIGN

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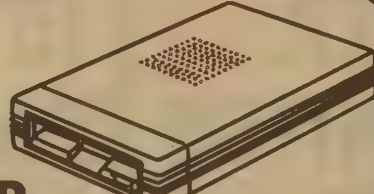
FUJITSU



MAGNETO OPTICAL 230MB REWRITABLE FOR MAC

FW2905A01
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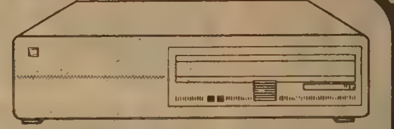
270MB Syquest Removable Hard Disk Ideal for Back-ups!



- Cables, terminator, and formation software included
- 3.5", 270MB cartridge included!

#1979013

$539

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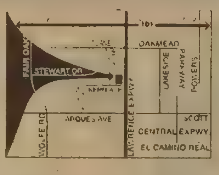
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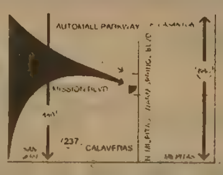
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540MB SCSI HARD DRIVE

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128K Cache
#1899029
Maverick 2M30540MVS

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540MB SCSI HARD DRIVE

3.5" X 1"HT.
10msec Access
CP-30540
#1802221

$257

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1.08 GB SCSI-3, 9MSEC, 1" HT, 5 Years Warranty
Model 1080S
#1899052

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1.06 GIGABYTE SCSI - II HARD DRIVE

1" SIZE • 9MSEC FAST ACCESS • 256K CACHE
SMALLEST 1 GIGABYTE
#1844890

$537

Quantum™

2.1 GIGABYTE SCSI-II HARD DRIVE

Empire 2100s
#1928110

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SEAGATE 1.05 GIGABYTE SCSI HARD DRIVE

- 9msec Access Time
- 1/2 ht.
- 256K Cache
- 5 Year Warranty

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Seagate

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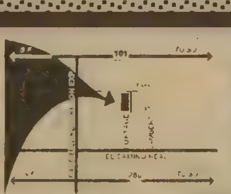
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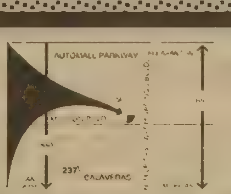
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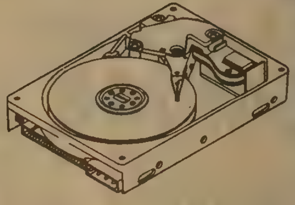
213MB 3.5" IDE HARD DRIVE

3.5" IDE Hard Drive 1" Ht.
13ms Average Access Time
SHD3211A
#1936247

$137

Limited to supply on hand.



250MB 3.5" IDE HARD DRIVE

3.5" Form Factor 1" Ht.
SHD3122A
#1786011

$145

Limited to supply on hand.

Maxtor

290MB IDE HARD DRIVE

MAXTOR 7290A
#1949597

$155

Limited to supply on hand.

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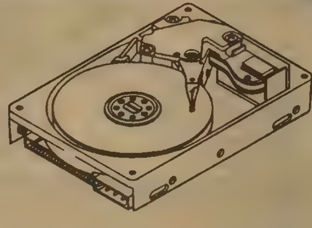

345MB IDE HARD DRIVE

1" HT. • 15ms Access Time • 345MB Formatted Capacity
MAXTOR 7345A
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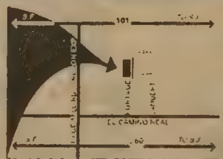
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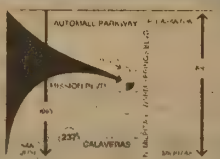
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Maxtor

420MB IDE HARD DRIVE

3.5" x 1" Ht.
12 msec Access Time
256K Buffer
7420AV #1972979

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420MB IDE HARD DRIVE

3.5" x 1" ht.
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CONNER

420MB 3.5" IDE HARD DRIVE

14ms Fast Access
3.5" X 1" • 32K Buffer
IDE Interface
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560MB IDE HARD DRIVE

3.5" x 1" ht. 12MSec Access
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540MB IDE HARD DRIVE

3.5" X 1"HT. • 12msec Access
CFA540A
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850MB ENHANCED IDE HARD DRIVE

- 1" x 3.5" Size
- 12MSec Access
- 256K Buffer

CFA850A
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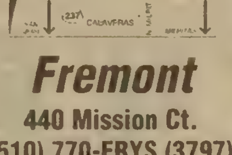
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250MB TAPE BACK-UP

40/80/120/250 MB Format
Internal Drive runs off floppy controller
Uses DC-2120 Tapes

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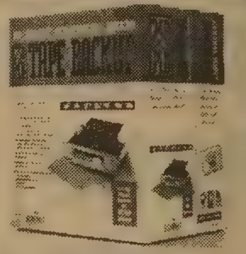
Model DJ-20
#1610068

SUMMIT™ MEMORY SYSTEMS INC.


TAPE BACKUP

250MB TAPE BACK-UP

250MB Internal Tape Backup
Runs off of Floppy Controller
Central Point Software For Windows & DOS
2 Year Warranty

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Model SE250
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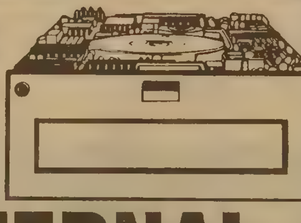

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Uses DC2120 Tape Cartridge
C250MQT

TAPE CARTRIDGE INCLUDED

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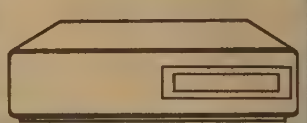

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Up To 250MB Back-up, External Plugs Into Parallel Port.

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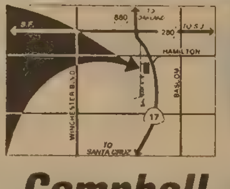
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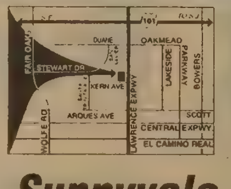
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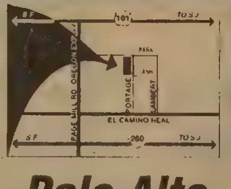
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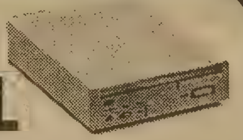
TEAC SuperQuad 4X Quad-Speed CD-ROM Drive

- 600 KB/S Transfer Rate
- 195ms Access Time
- AT Interface and Cable
- SuperQuad 4X

CD-55
#1954528

$298



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Formerly Texel

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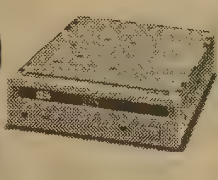

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- MPC 2 Compatible
- 320MS Access Time
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- Multisession Kodak Photo CD
- CD-ROM Interface Adapter

CDU33A
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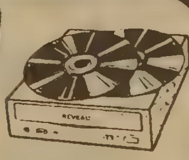

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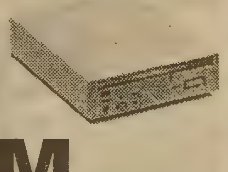

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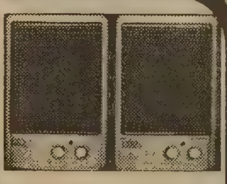

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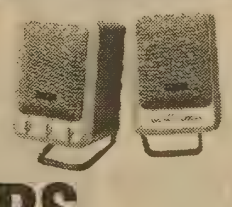

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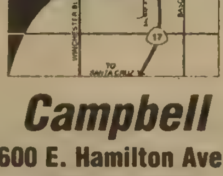
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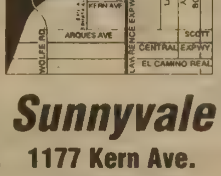
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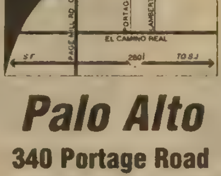
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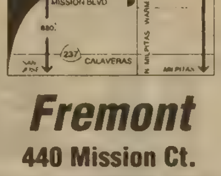
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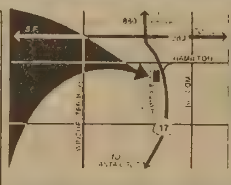

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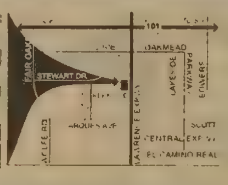

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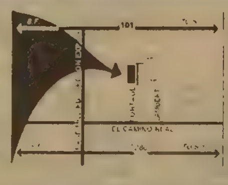

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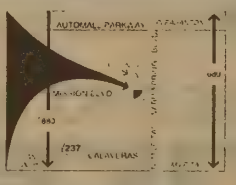

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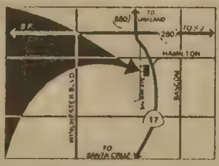
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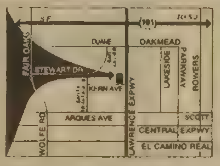
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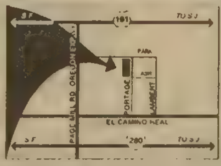
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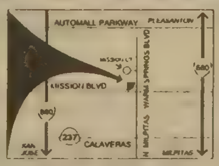
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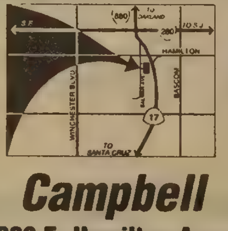
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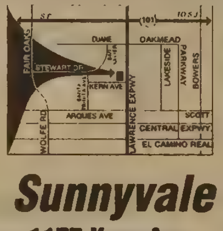
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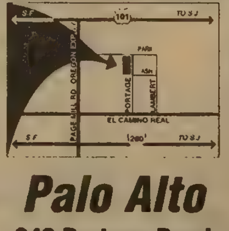
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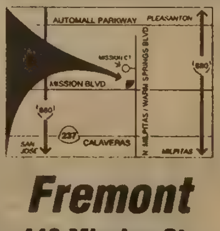
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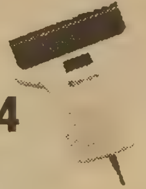

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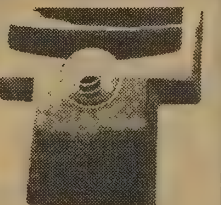

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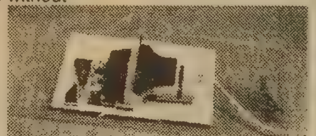

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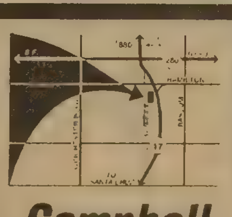

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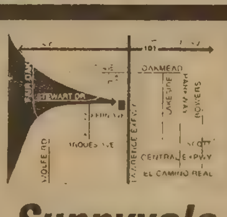

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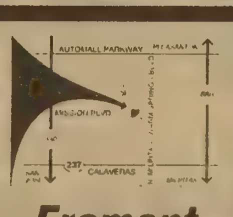

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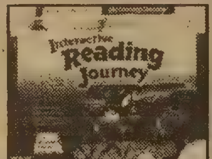

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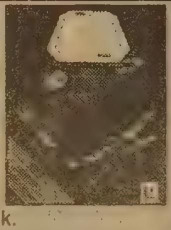

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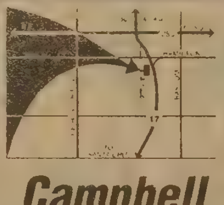

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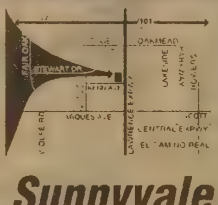

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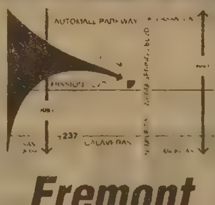

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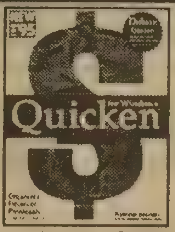

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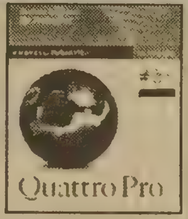

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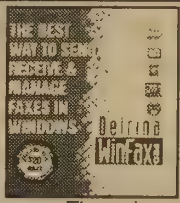

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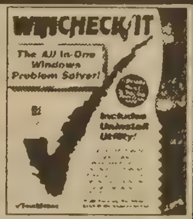

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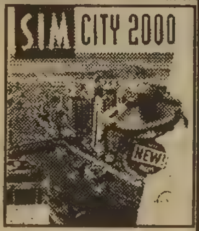

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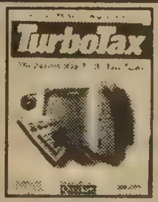

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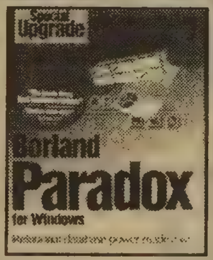

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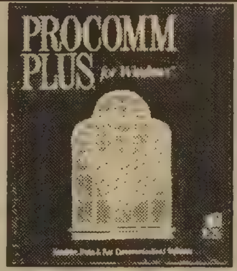

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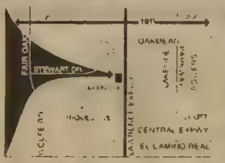

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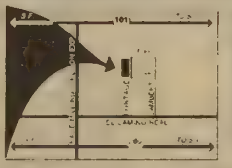

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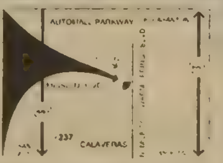

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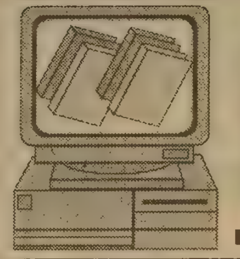

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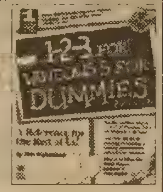

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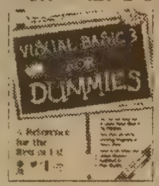

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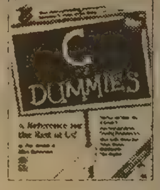

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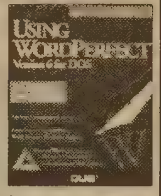

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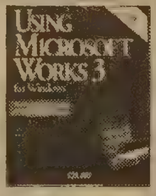

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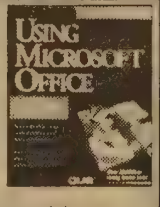

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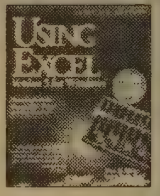

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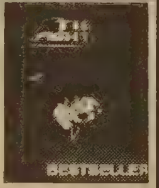

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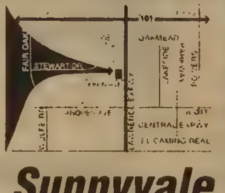

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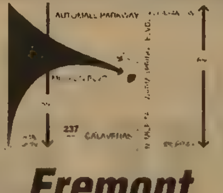

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• Quality - ALPS mechanical keyswitches for click and feel that users prefer • Durable - Lasts up to 20,000,000 keystrokes • Comfortable - Dual height slant adjustment • Versatile Compatibility - AT/XT switch selectable • Reduced RF Interface - metal shielding and ferrite filters reduce electronic emissions which cause interference with radio & TV • 12 function keys • Convenient channel to store and direct cord for left, center, or right position

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SIIG, Inc. WAVETOUCH 101 TACTILE FEEL KEYBOARD

Durable 10,000,000 keystrokes • Comfortable - unique wave shape makes typing easier • Versatile Compatibility - AT/XT auto-detect (no switch) • Industry Standard - 101-key enhanced keyboard layout (QWERTY) • Dual-height adjustment for typing comfort Num Lock, Caps Lock and Scroll lock LED indicators • 6' coiled coil

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SIIG, Inc. Suntouch Jr. CLICK KEYBOARD

Full function and spacing of a 101 Keyboard in a reduced footprint

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KEYBOARD & MOUSE WITHOUT MOVING YOUR HANDS WITH THE 101 PC STYLE J.M. KEYBOARD

Hold down the J Key under your right index (pointing) finger and it automatically becomes a very sensitive mouse! No more moving your hands from the keyboard to the mouse and losing time, deskspace, or your place on the keyboard. All of these mouse functions are available while the J-Mouse is being used:

- The primary click button is the F key nnder the left index finger.
- A double click button (the G key) makes double clicking a single easy hit.
- Windows, DOS and Novell compatible. Two and three button mouse emulation.
- The speed can be changed by pressing the top row numeric keys (1=slowest to 0=fastest) or even in a greater range via the setup program.
- Nine additional mouse buttons are available for fast access to Windows functions (Such as delete, cut, copy, paste and undo).

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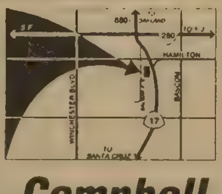
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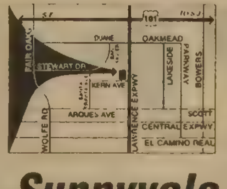
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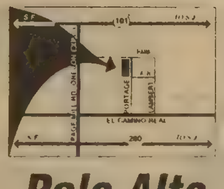
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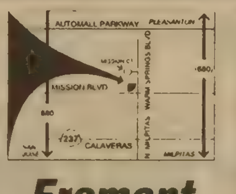
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POWER CENTER W/FAX MODEM PROTECTION

- Power up entire system with master switch or control each component individually
- Telephone line suppression provides protection to fax and modem
- RFI/EMI Filter5ring reduces static
- Organizes cords out of the way

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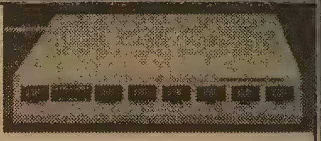
SURGE PROTECTION POWER CENTER



- 5-outlet surge protector
- 5 individually lighted controls
- Lighted master on/off switch

Interex® Computer Products

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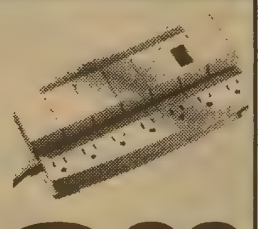

- 7-Outlet
- 360 Joules Surge Protection with $10,000 Equipment Warranty

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- 18,000 Amp Suppression
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- Heavy Duty 7 ft. Cord

And Diagnostic Indicators which Alert You To:

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- Damage to protection circuitry
- Loss of AC power

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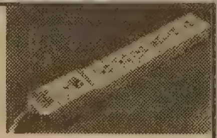

- Suppresses Surges up to 120 Joules
- 15 AMP Circuit Breaker
- PlatinumColor
- 6-outlets

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- Response Time <1 Nanosecond

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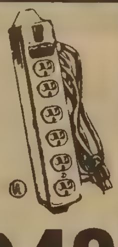
6-OUTLET SURGE PROTECTOR



- PM6SP2
- 140 Joules
- Noise Filtering
- Five Year Warranty

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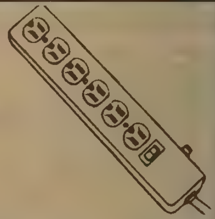
6-OUTLET BASIC SURGE PROTECTOR



Clamping ResponseTime <1 Nanosecond
Energy Dissipation 60 Joules

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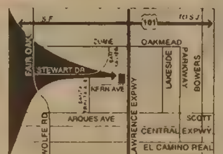

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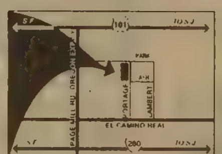

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ACS ANTI-CURL SYSTEM

WITH PAPER CUTTER

Brother's breakthrough fax machine incorporates newly developed therma plus technology which uses fax paper that feels like plain paper and reduces print fading (lasts 3 times longer than thermal paper under normal filing conditions, and you can even use a highlighter!). Other features include, 10 page document feeder, 15 station memory, 16 level grey scale, activity report, polling and much more for only...

$279

Model
FAX-620
#1896510

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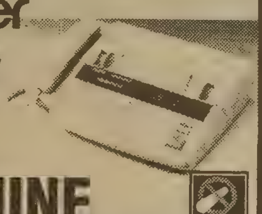

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ACS ANTI-CURL SYSTEM

WITH PAPER CUTTER & 32 LEVEL GRAYSCALE

From Brother the high tech home office leader come this feature laden fax machine with 32 level grayscale for enhanced contrast reproduction, 60 station memory, 10 page auto document feeder, anti-curl mechanism, smoothing, multiple resolution transmission, 16 digit LCD display, activity report, Polling, next fax reservation, and much more. Now just....

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Model
FAX-640
#1917437

brother

THERMA PLUSPAPER

FAX MACHINE

ACS ANTI-CURL SYSTEM

WITH 1MB MESSAGE CENTER & PC LINK CAPABLE

Brothers revolutionary fax machine offers a digital message center for either18 minutes of recording, up to 50 page of memory for out of paper reception, or you can configure the storage memory to be usedon a first come first serve basis. The optional missing link will allow this fax machine to act as a PC/fax modem, a scanner, and a printer! Other feature include anti-curl system, uses ThermaPlus paper, quick-scan, 164' paper roll capacity, 15 page document feeder, auto cutter, sequential broadcasting, and 60 number memory just to name a few.Now only...

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Model
FAX-820
#1925195

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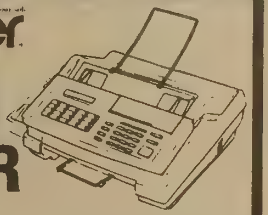

PLAIN PAPER FAX

WITH 256K MEMORY

Brother's done it again! Last year Brother broke the $400 price barrier in paper cutter Fax, and for an encore, Brother has destroyed the $799 stand alone plain paper Fax barrier with this unbelieveable value. Its 200 sheet paper cassette, 30 page auto document feeder, on-screen programming, "smoothing" enhanced image resolution, 48 digit LCD display, multiple resolution transmission, 32 level grayscale, 160 station memory, and Fax/Tel Switch makes this the best value you will find at only.....

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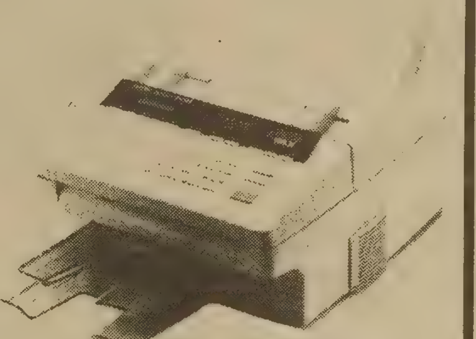
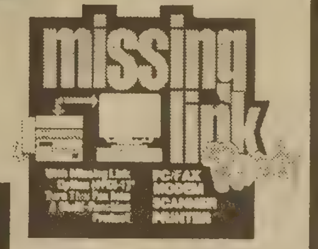


PLAIN PAPER LASER FAX AND COPY SYSTEM



WITH PC LINK CAPABILITY

Brothers state-of-the-art Laser fax machine combines laser print quality with copier capabilities of up to 99 continuous copies along with reduction and enlargement capabilities, and PC Link capability enabling you to utilize the laser fax machine as either a Scanner, PC/Fax Modem, or a printer! Other features include 256k memory for out of paper reception or sequential broadcasting, 30 page document feeder, 200 page sheet paper tray, 140 station memory, 32 level gray scale, and much much more! The best home office investment you will ever make at just...

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Model PPF-2500
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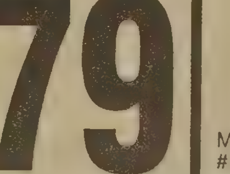

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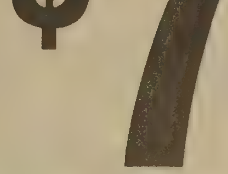

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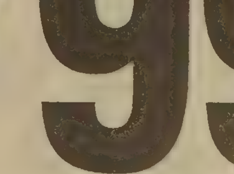

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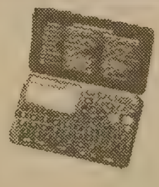

34K PERSONAL ORGANIZER

Perfect for the business person on-the-go, this compact data bank incorporates a 14 x 3 line display, built-in calendar, schedule, phone /memo, memo pad, expense, clock, anniversary, and calendar functions as well as QWERTY keyboard to simplify data entry. Once you've used this electronic marvel, you won't leave your home or office without it.

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Model YO-110
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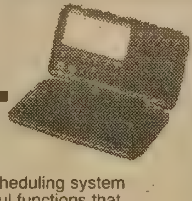

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WITH 128K MEMORY

This business organizer scheduling system comes packed with powerful functions that are practical and easy to use. The QWERTY Keyboard, telephone directory, calendar, memo function, schedule alarm, world time function, home time function, and schedule keeper will prove to be an invaluable tool in keeping your busy days in order. An excellent investment at...

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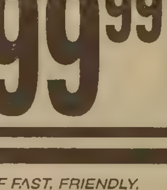

512K PERSONAL ORGANIZER

WHILE THEY LAST

WITH TOUCH SCREEN TECHNOLOGY

This Sharp Wizard lets you leave your portable computer at home but puts the power of that computer in your pocket! Here's a small sampling of the innovative features. Touch screen technolog ywhich allows you to write or draw on the screen using the Wizard pen, filer which organizes related data into folders that can be transferred to another touch screen Wizard via infrared, and a true word processor with a large screen display and a key board that's 75% the size of a standard PC key board. The possibilities are endless at only...

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Model OZ-9600 II
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POCKET SIZED 512K COMPUTER
WITH BUILT-IN SPREADSHEETS

Psion has redefined the state of the art in hand held computers with the new Series 3. It may be small, but this pocket-sized programmable computer comes equippedwith features found in desktop machines plus powerful built-in software, including a full specification word processor and outliner that's compatible with Microsoft word. When using the Series 3 you will quickly learn from the system of graphic displays and option list how easy the Series 3 is to use. And with Psion's unique Multitasking Operating System, as many of the facilities as you want can be used at the same time! Other features include an automatic phone dialer, world information, a time and personal management file, powerful graphics program -ming language (OPL/w) which will enable you to write your own applications and two expansion ports for plug in SSD devices for unlimited memory and software

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Model SERIES 3A
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1MB PALMTOP COMPUTER
WITH 80x25 FULL SCREEN MS-DOS 5.0 & BUILT-IN POCKET QUICKEN

The smallest, lightest HP PC ever comes equipped with complete organizer software to manage your time, tasks and data, plus you can retrieve information instantly with a full range of built-in personal productivity tools. The pull-down menus and dialogue boxes make it simple to master the familiar commands, and the high-resolution display with zoom option is easy to read ! With Lotus 1-2-3 built-in you will have full spreadsheet capability, including graphics and macros. Also includes CC:Mail built-in. Now only...

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Model HP-200LX
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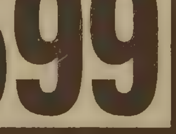

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RUNS ON 4 AA BATTERIES UP TO 10 HOURS

2MB RAM • 2MB ROM • 2 PC MCIA Type II Slots Fax/Modem Built-In • Serial/Parallel • 640 X 400 Resolution Preloaded Software: DR DOS • Bitfax LapLink XL • BitCom DataSel Gold • Contact Manager.

AA batteries not included

By OMRON.

$599

Model TOUCAN
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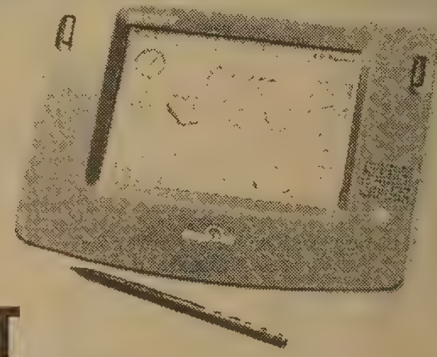
SONY

Magic Link



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A revolutionary concept in electronics which integrates the most useful features of personal computers, telephones and pagers in a handheld, portable unit. By incorporating Magic Cap™ communicating applications platform and Telescript™ technology, the Magic Link™ Communicator represents a leap forward in the use of technology to enhance your lifestyle. Features include integrated Fax/Data Modem built-in mic/speaker, Pocket Quicken, PenCell Spreadsheet, Spell Finder, Datebook, Notebook, Calculator, File Cabinet, mind game software, and much more. Magic Link™ will also facilitate various modes of communication including Phone, E-mail, Fax, Pager and Infrared, as well as supporting AT&T PersonaLink℠ Services and America Online service.

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Model PIC-1000
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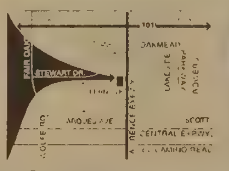

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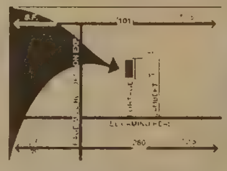

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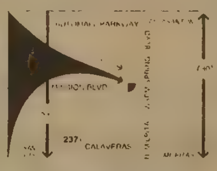

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Answering System with Auto-Logic Operation, Tone Remote Control, Digital Display, Message Memo Recording and remote turn on, Auto-Logic Operation automatically rewinds, plays messages, stops at the last message and resets itself at the touch of one button.
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DUAL MICRO CASSETTE ANSWERING SYSTEM
Panasonic's new dual micro cassette answering system offers an LCD Call Counter, marker message, room monitor, auto disconnect, electronic auto disconnect, electronic volume control, audible message alert, and much more for only...
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Model KX-T2100
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WITH VOICE TIME/DAY STAMP
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WITH VOICE TIME/DAY STAMP
Perfect for the home or office, this Panasonic two line answering machine offers voice time/day stamp, voice prompts, 2 variable greeting messages, room monitoring, message alert, call screening, auto interrupt, toll saver, and more. Now just...
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SPEAKERPHONE
For the office or home, this phone has all the features you need. It has a speaker phone, 28 station automatic dialer, automatic redial and much more.
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WITH LCD DISPLAY
From Panasonic comes this fully featured 2-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 24-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...
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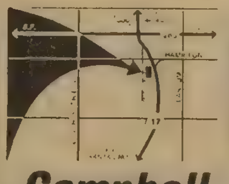

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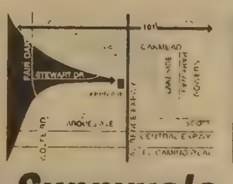

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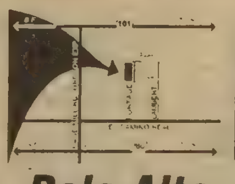

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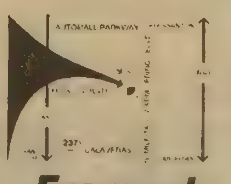

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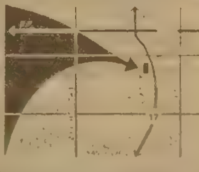

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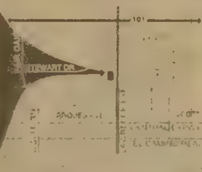

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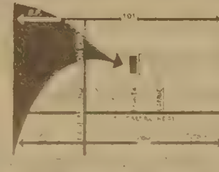

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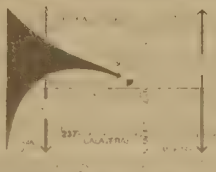

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continued from page 168

software worlds: we get binary software that runs right out of the box; and if we don't like it we didn't pay anything for it and we can get the source and modify it to suit ourselves.

"Although he must get tons of email from Linux users. Patrick has always been friendly and quick to answer when I have sent him questions."

Ted Waitt

Gateway 2000

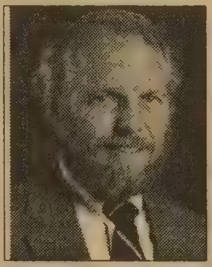
Chairman, President, and CEO

Sure there's a shakeout in the PC business and a lot of its competitors in the mail-order business are hurting, but not Gateway, which is still experiencing sales that nearly double the previous year's figures. After a year that saw the company's first stock offering and an expansion into Europe, Waitt continues to drive an efficient, customer-responsive business that serves what he characterizes as a technically sophisticated consumer market. He's bullish on Pentium, saying orders have actually increased since the bug announcement and that Gateway is the nation's leading supplier of Pentium-based systems.

John E. Warnock

Adobe Systems

Chairman and CEO



Citing the impact of distributing company information via Web pages, Warnock believes the world is on the verge of a technology-driven social change unparalleled since Gutenberg. Toward that end, he's keeping Adobe at the forefront of authoring and document exchange tools, a position enhanced by its recent merger with Aldus.

Jim Warren

Columnist

Warren took a brief break this year from hell-raising on behalf of computer-based voter access to government to accept the Hugh M. Hefner First Amendment Award honoring his work in the field.

Since last year's successful passage of legislation allowing online access to bills in progress in Sacramento, Warren has gone on to form the GovAccess mailing list on the Net, thereby simultaneously informing hundreds of journalists, activists, and interested bystanders of related issues, and is a frequent speaker on civil liberties subjects. He also continues to serve on Autodesk's board of directors.

Ken Williams

Sierra On-Line

Chairman, President, and CEO

In addition to keeping Sierra's preeminent position in PC entertainment market share, Williams has a strong interest in the emerging area of online entertainment, particularly interactive gaming. Toward that end, he's been involved in a joint venture called the ImagiNation network with AT&T; during 1994 the relationship changed somewhat as Sierra sold its share back to AT&T and entered into a contract to develop networked content for the network.

Lou Williams

Castro Middle School, Campbell

Teacher

Student Matt Clark puts in a good word for this asset to education in Silicon Valley: "Mr. Williams is a teacher at Castro Middle School, and he helps anyone who needs help using the network, finding the right file and printing files. He helps with many other problems too."

We'd like to thank Matt for bringing Mr. Williams to our attention, and we're happy to salute his work. We'd also like to commend the hundreds of unnamed teachers, wherever they are, who help students reap the benefits of technology.

Ann Winblad

Hummer Winblad Venture Partners

Partner

Since cofounding Hummer Winblad as a software-only venture capital firm a few years ago, Winblad has earned a reputation as both a knowledgeable industry observer and as a relentlessly proactive asset to her portfolio companies at all stages of their evolution. In addition to serving as a board member on companies including Berkeley Systems and Humongous Entertainment, she also served on the boards of Reference Software, T/Maker, Slate, and Central Point Software, and facilitated their advantageous acquisition by WordPerfect, Deluxe, Compaq, and Symantec, respectively.

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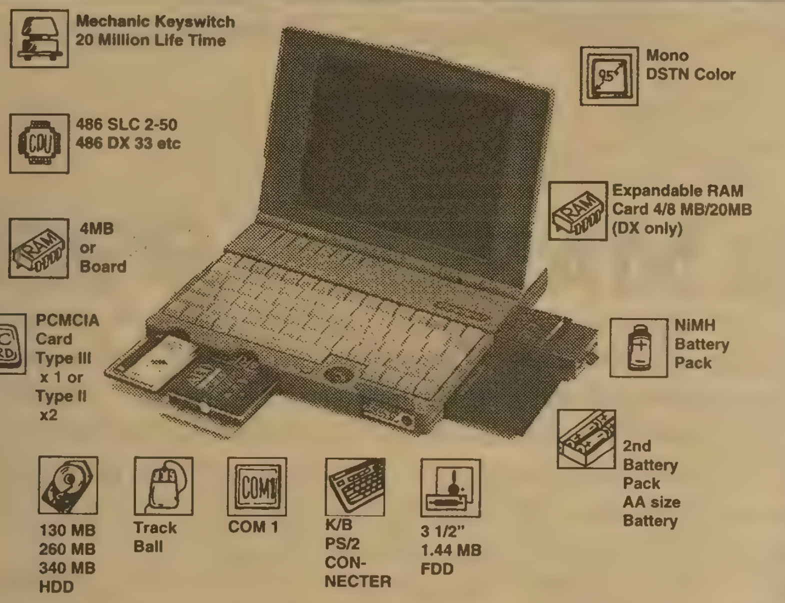
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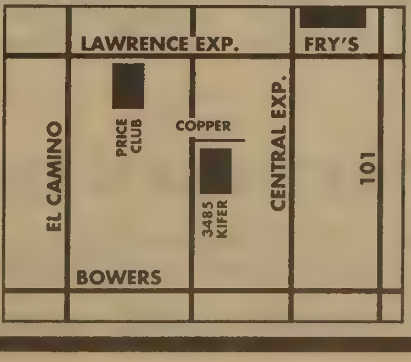

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MOSAIC & NETSCAPE:

THE CHANGING FACE OF THE INTERNET

MARC ANDREESSEN ON THE IMPACT OF MOSAIC AND THE FUTURE FOR NETSCAPE

BY MICHAEL ROBIN
PHOTOS BY SUSANA MILLMAN AND
MOSAIC COMMUNICATIONS CORPORATION

IN MARCH 1993, after three months of concentrated work at the National Center for Supercomputing Applications (NCSA), Marc Andreessen and Eric Bina released the first version of Mosaic for UNIX, making it freely available to download from the Internet. Within months, Mosaic had captured the attention of both longtime Internet users and newbies, including a significant proportion of businesses. By October 1994, there were an estimated three million people using NCSA Mosaic for UNIX, Windows, and Macintosh.

NCSA Mosaic is a graphical information retrieval interface for the Internet, which makes it significantly easier to access and distribute information on the Net. Information producers can use it to present documents that include not only text, but graphics, audio, and even video clips to be viewed online, in real time. When used as a browser for the World Wide Web, Mosaic allows users to navigate through multimedia documents by clicking on hyperlinked words, icons, and images. Equally important, Mosaic has shown a broad base of users that the Internet is less a mysterious technical environment than it is an integral tool in our social, intellectual, and economic lives.

Marc Andreessen was an undergraduate student in Computer Science at the University of Illinois, Urbana-Champaign, working at NCSA. He wanted to figure out a way to make information on the Net "interesting and compelling for people to explore." The solution, explains Andreessen, was to "build a program that pulled together all the resources of this global network," the Internet. To accomplish this he assembled a team of six fellow programmers at NCSA, and in the tradition of the Internet, they proceeded to build NCSA Mosaic, incorporating anything else they could find on the Net that would be useful.

Following his graduation from the University of Illinois, Urbana-Champaign, in 1993 with a BS in Computer Science, Andreessen left the relative isolation of the academic world and southern Illinois and came to California. He began working at Palo Alto-based Enterprise Integration Technologies (EIT), the company that manages CommerceNet. Andreessen's career took another turn when he met Jim Clark, founder and former chairman of Silicon Graphics. Their initial meeting established a partnership that led to the formation of Mosaic Communications Corporation in April 1994. By fall they had released a new (beta) Internet browser designed for home users, Netscape. In November, the company changed its name to Netscape Communications in an effort to establish its corporate identity separate from Andreessen's earlier work at NCSA and to avoid potential difficulties from using the name Mosaic. On January 1, 1995, they moved across town into a larger office complex to accommodate their continued explosive growth.

I met with Andreessen in Netscape's Mountain View offices to talk about the impact of Mosaic and Netscape—upon how the Internet is used and who is using it, as well as its impact on him. (Netscape Communications Corporation, 415/254-1900 or 1-800-NET-SITE; Home Page: http://home.mcom.com/)

What was the original problem you were trying to solve by creating Mosaic?

We decided that the thing to do was build a program that pulled together all the resources of this global network and all these really powerful desktop computers we had sitting there. We wanted to do something that would make information interesting and compelling for people to explore.

Was your goal a browser for the World Wide Web?

The original goal was to encompass it all; to access everything on the Internet. We just incorporated, borrowed, or stole as much stuff from as many people as we could, which is how we were able to write it in three months. (Netscape, on the other hand, was not written in three months and not by two people.)

And this was originally done with the academic or scientific community in mind?

It was definitely a research prototype. We made a number of assumptions in the beginning, like you had unlimited bandwidth, for example. We just assumed that when you were pulling things over the network you did not need to worry about how long it takes to pull them over. This has led to some interesting situations for people trying to use that code, or use derivatives of that code, on consumer-grade or typical business situations.

From where you were sitting in 1993, as Mosaic took off, what unexpected directions and developments did you see?

The first was the widespread popularity that started to accrue—the number of people that were using it, the attention it started getting. Then of course, the process of commercialization. The university decided there was money to be made here. The process they went through was something I had not seen before.

There were continual ongoing debates about what sort of copyright to put on it, how free to make it, how available to make it, how to commercialize it, whether to actually derive revenue from it or whether to treat it like the research prototype that it was. There were also the more mundane questions of whether to charge per copy or a flat fee to companies that wanted to use it and whether to give out source [code] as had been done with most previous NCSA programs.

As early as the spring of '93 the administrators at NCSA were encouraging us to start our own company. It was never quite clear how to do that or what we needed to do. It took moving out to California and meeting people here, in particular meeting Jim [Clark], to realize how we could do that.

All of a sudden Mosaic was being used by a growing variety of people to do more and more things. What sort of things surprised you in how people were using it?

It was certainly a continual surprise the way people were using it. In particular, the fact that businesses were coming up [on the Net] and doing interesting things with it. Also, that businesses were starting to use it for their internal networks for information sharing, for collaboration. It indicated to me that there was this hole out there that wasn't being filled by existing software for networks. If this code was not necessarily the answer, at least is was pointing in the direction toward where things had to go, to where there was a big opportunity to make these networks really powerful.

When you say businesses doing interesting things on the Net, is this mostly the type of things we usually hear about—press releases and marketing information?

That was the first wave of use, but they kept trying, and they continue to today, to push the envelope of what they can do. They see where they want to go. They want to offer goods and services over the Net as well as information sharing within their company and other companies that they are collaborating with. There is a broad range of ways companies want to use this and they just keep pushing and pushing.

Certainly with the research prototype businesses hit a number of walls, such as security, where you couldn't really do transactions, and lack of a robust cross-platform implementation that made it very difficult to deploy it widespread across a corporation. The server software wasn't robust enough to let you offer commercial transactions over the Net and there was no standard way for linking into all sorts of back-end systems.

A lot of people did some interesting things to get past those walls. But fundamentally the architecture itself just wasn't there to meet the range of things people wanted to do with it. This is why there is both such pressing demand for something that takes what Mosaic started and branches off from there into the commercial realm. This is why we started this company.

Mosaic was neither the first nor only graphical tool on the Internet. Why do you think it took off so fast?

It was fun and easy to use. People could pull it down [from the Net], install it, and boom, it worked.

The other part was, and this gets back to the server side, it was straightforward for people to do things specific to what they were doing. It was easy to build applications on top if it. People would be able to pick up the server software and be able to build an application on the back end that had something to do with their business, their activities, or their research. They could then make that service available to the entire network, and since everyone had the front end everyone could access it. It became a very powerful way to build applications over the network.

How would you clarify the relationship between Mosaic and other Net resources, in particular Gopher and WAIS? And the relationship of Mosaic to Netscape?

With relation to other Internet resources, basically, Mosaic treats them as legacy systems that it ties into. WAIS is a special case because it is a search engine that can be easily tied into on the back end.

Gopher got caught in the evolution of the information systems themselves. Its roots are in the more traditional VT100 view of the world. Mosaic

MOSAIC & NETSCAPE *continued...*

and Netscape treat it as a legacy system that you can access but does not do a whole lot beyond that.

Mosaic in relationship to Netscape. Because of what it accomplished and the experience of building it, we consider Mosaic to be the research prototype for this kind of software. We know we made a lot of mistakes. In fact, they were pointed out to us in great volume over the course of '93, by lots of people.

You attributed Mosaic's success to "it's fun and it's empowering." If it is mostly being used by companies to disseminate information, there really is not much interchange or interactivity. How is this empowering?

The key here is not any specific application. The key here is that the Net is a communication medium, it's a channel. Uniquely as a communication medium, there are no restrictions over what can go over it, what you can do on it. You are not limited to any of these previous models of TV and cable or even newspaper or radio.

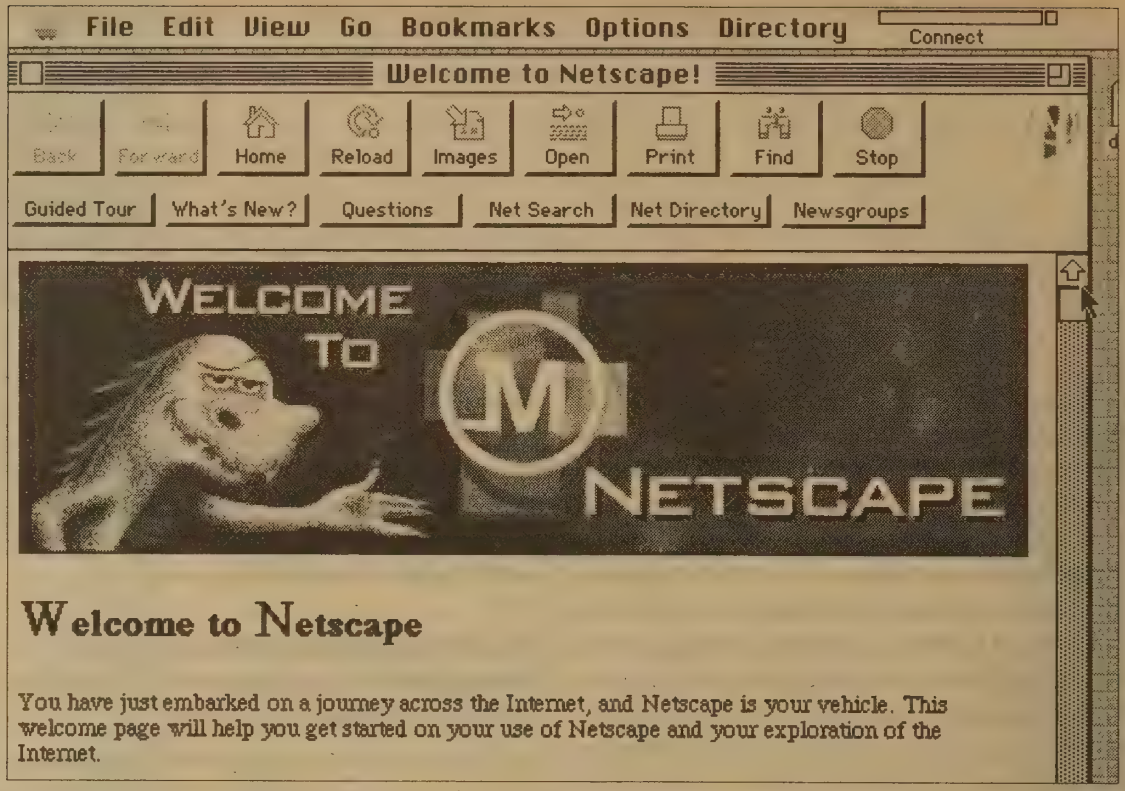
Increasingly what you can do, and the next wave of what people are doing on [the Net], is private activities. So go from point A to point B, establish a secure link, and do whatever you want. What that doesn't do, it doesn't interfere with any of the other activities that happen on the Net. In fact, in the process of this evolution, the result is that Internet access is going to become much more widespread. It is going to become even more powerful and an even greater resource for people doing the sort of traditional activities that have always taken place on the Net.

The key here is that, as the uses of the network expand, the network doesn't get less powerful or more restrictive. As the infrastructure itself grows, the Net becomes more open and better able to accommodate what everybody wants to do.

The software we are developing here tries to expand the range of things that people are able to do on the network, particularly for nonprofit organizations where there are very innovative people working with the software.

The initial releases of Mosaic and Netscape are not very interactive. For example, a user would need to launch other applications to do almost anything interactive. How will Netscape evolve? Will these other applications be more integrated?

It definitely has to evolve. The communication aspects are going to be drawn out more explicitly in the future.



Welcome to Netscape

You have just embarked on a journey across the Internet, and Netscape is your vehicle. This welcome page will help you get started on your use of Netscape and your exploration of the Internet.

Netscape addes a row of buttons and menu options to make navigating the Internet easier.

Could you say more about that?

We want to make it easier for people to build applications that involve communication. You get a powerful set of capabilities when you tie together information resources with communication. People being able to explore information, being able to share with one another, that is the sort of thing we are going for.

There has been a lot of attention on Mosaic, the client software, but very little on the server software. Was that part of the same project?

People have gotten distracted by this glitzy front end.

Rob McCool, who is on staff here, basically wrote httpd from the ground up and maintained the NCSA httpd server over the course of '93. That had as big a role to play as Mosaic did. It was easy to pull down and set up. Rob also did a number of really cool things, making it easier for people to tie in other back-end systems.

A big part of what we are doing in this company is that we are putting more resources into the back end than the front end. We are putting more development work into the servers and into integrated applications built around the servers than we are into the client. Not only is that where there is real commercial value, but also because there is so much interesting work that still needs to be done before you are able to offer commercial services over the network—you need everything from access authorization using databases to maintaining lists of users and their access privileges to transaction control.

There has been a lot of talk about a paradigm shift created by Mosaic. The PC took computing power to the individual, breaking down the monolith of the mainframe. What type of shift has Mosaic created?

Mainframe to PC basically scattered everything out. It put a computer on everyone's desk. This ties it all together and takes advantage of that happening. The result we get is much, much, much greater than the individual parts.

One impact is the creation of a new job category—people being hired as "html'ers" or "web masters." This is changing the traditional framework for communication on the Net. We end up with professionals putting up the information.

I don't think it is a shift. Both are increasing. If you look at the rate of change, one is coming from behind and is growing faster than the other. But in terms of what the Net is used for and how it is used, traditional applications still dominate and are continuing to grow just as fast as they ever have. I think these two sets of worlds, these two modes of commercial/noninteractive on one side and noncommercial/interactive on the other complement each other. I think they are going to feed back and forth off of one another.

Does Netscape address a different set of questions than Mosaic?

In its first incarnation, which is what you see now, the key things we were addressing were the show-stoppers that were stopping commerce from taking place—the lack of security, robustness, and performance. In particular, to reach into the home over slow lines—people need to be able to access everything. There is no reason to limit them. At this point, about the only thing they cannot reasonably do is video. There are fairly effective ways to do audio over 14.4 and we will be exploring that. Those were the first things that we tackled.

Is the slowness that people experience with Netscape over 14.4 connections a result of the software or the applications that people build? In other words, is it the technology or the way Web pages are designed, with big graphics and designers not working with the current state of the technology?

I think people know where the medium is and

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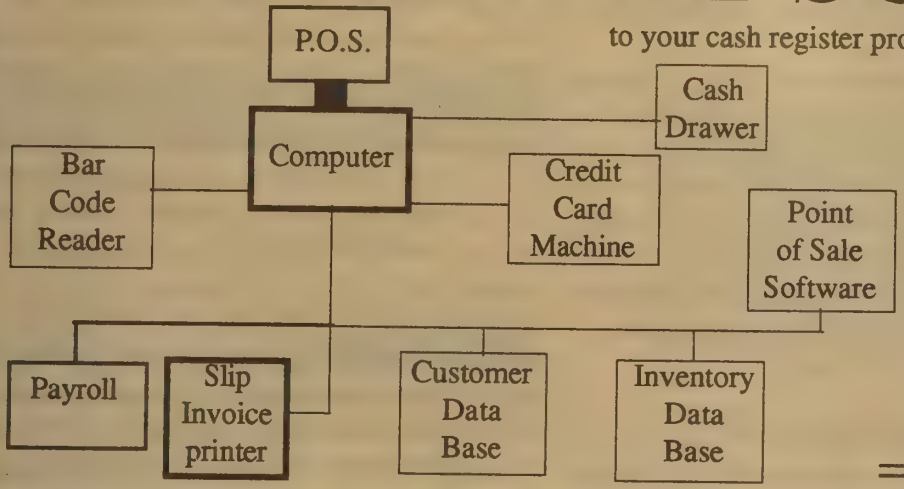

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THE KEY HERE IS THAT, AS THE USES OF THE NETWORK EXPAND, THE NETWORK DOESN'T GET LESS POWERFUL OR MORE RESTRICTIVE.

what they want to do with it. I think it is up to those of us doing the software to really do the software efficiently in such a way that you can reach into the homes. There are things that we have yet to do that will make 14.4 more compelling. There are things about Netscape that could be more efficient in presenting the user experience. We will certainly be pushing forward on those. I think the trend is absolutely going to be making 14.4 users have the same experience as the T-1 users have had all along.

What is the W3 Consortium?

A body that's forming a consortium along the lines of the X-Consortium, sponsored by MIT. It is going to be in a standards-setting role for next generation protocols, formats, and architectures for the Net, particularly for a lot of things companies want to do with it.

We were founding members. That means that we are participating in the processes that are evolving the next generation of stuff. So far the bulk of the work that has gone on at W3C has been devoted toward security because that is such a pressing issue. The faster security gets out there in a way that we can all intercommunicate, the more clients we will be able to sell, the more servers we will be able to sell, and so on. That's in everyone's best interest, and there are already a number of companies working together under this umbrella to figure this out.

The security protocols you are proposing is "https" and something called Secure Socket Layers. What are sockets and how does this impact Netscape?

Sockets are the abstraction that you use when you are communicating over the Internet. To go from point A to point B on the Internet to pass information from one point to another, you open a socket. What that really means is that you have this place that you can stuff data down or read data from. The first thing you do is open a socket you write, write, write, then you read, read, read, and close down the socket. The program on the other end is going to be there listening. As soon as it receives a connection it is going to establish its socket, giving you a channel to receive the information, write it back out, and close it down.

That is fundamentally how Netscape works overall; the way it talks to servers across the Net. This is a standard way of doing things over the Internet. Significantly, this is also becoming a standard abstraction across all kinds of different platforms. The fact that TCP/IP is fairly widely adopted across all the big platforms—UNIX, the mainframe world as well as Macs, PC, even OS/2—means that the sockets layer is becoming the de facto API or way of looking at how you use TCP/IP. This provides commonality on the bottom layer for doing the communication.

What you don't have in that layer is a standard approach to security. Implementing security on top of that basically gives you two options. You can either implement security in terms of one particular way of talking over TCP/IP, talking over a socket. Or you can implement security by making a new layer that sits in between sockets and the application protocol.

Secure Sockets Layers is this layer that sits above TCP/IP, but it sits below things like http, ftp, gopher, telnet, and sntp. It basically provides a way for programs that are already written in such a way that they use sockets, to use secure sockets. This means that there is a way to authenticate both sides of the communication before the actual communication starts, and the communication itself in both directions is fully encrypted.

And this is seamless for the user?

Ideally it is seamless for the user. Also ideally, the user understands the implications for the activity that is taking place. That is, how secure is the link? Who is the person at the other end and are they who they claim to be? What is the strength of the encryption and how certain can I be that somebody isn't breaking into it? How certain am I that somebody isn't interfering with it as it's on its way to me?

Another standard, called Secure HTTP or SHTTP, is being proposed by EIT. Is this a competing or complementary protocol? Can they work together?

I consider them complementary. SHTTP, which I worked on when I was at EIT, takes the world view that what you are doing is using a particular application off a protocol called http to exchange messages across the channel. So SHTTP does things with those messages. It lets you take objects inside those messages and encrypt them, digitally sign them, and do things like that.

It addresses a distinct, but slightly overlapping, problem space. You can get many of the same effects by using either. What you can't do today with SSL is do things inside the message stream itself. The entire stream is encrypted. You can't reach inside and do particular things with individual objects.

What you can't do with SHTTP, today, is use it across other application protocols like NNTP for network news, or Telnet.

They come out of different philosophies. They address some of the same problems, but they are also quite a bit different. I think they are complementary. They are both proposals by companies to the W3C working group on security, and the specifications for both are freely available on the Net. We may at some point support its SHTTP. From our point of view there is certainly nothing religious about this.

Another way to look at them as complementary is that you could in fact layer SSL underneath SHTTP. You could run them both at the same time. They wouldn't conflict with each other.

The other thing to keep in mind, there are lots of other proposals about security. They all address different problems. There is a lot of work going on for embedding security in the IP layer for the next generation of the Internet protocol. That does not do us a lot of good today because the systems that are out there don't have that. But someday that may take over from what SSL is doing because it may just be buried in your networking layer.

Using RSA technology means that you end up producing two versions of your software, a domestic, full-strength version and a "lite" or crippled export version. How will Netscape Comm. handle this and have you encountered any reactions, in particular from large transnational corporations?

The basic story is that we are a US company and as such we are bound by standard US export laws. That means that we have obtained export clearance, except for a small group of countries, for our full security implementation but with limitations on the key lengths for the encryption algorithms. For example, one of the encryption algorithms that we commonly use is called RC4. It's a lot like DES except that it allows for arbitrary key lengths as well as a number of other interesting properties. We have export clearance for 40-bit RC4. A 40-bit RC4 message takes on average about 64MIPS-years in processing time to break. That is enough to keep you from cracking it in ten minutes but it is not enough where the NSA or somebody like that wouldn't be able to break it relatively easily. That is why they set the limit there. The software that we

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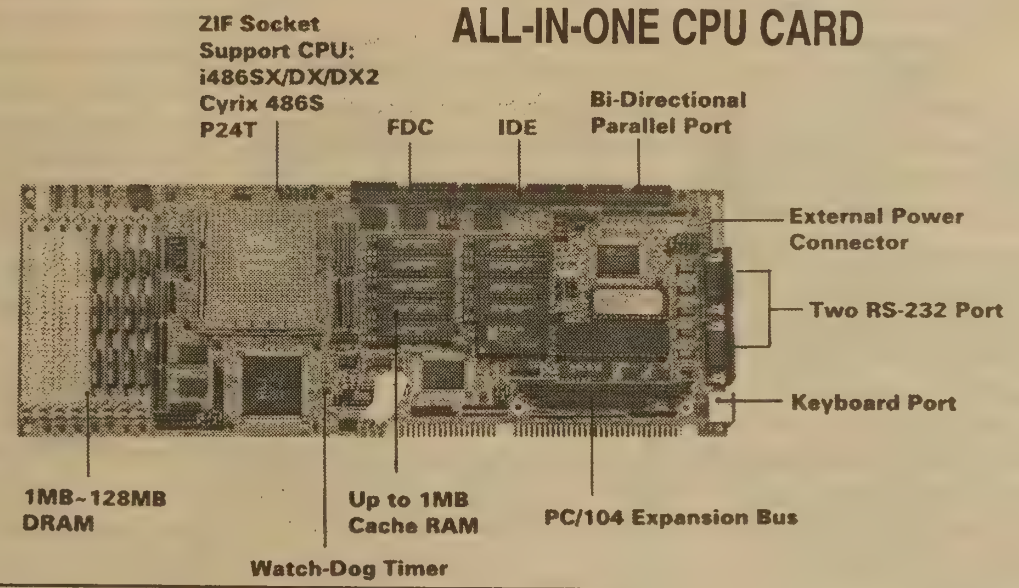
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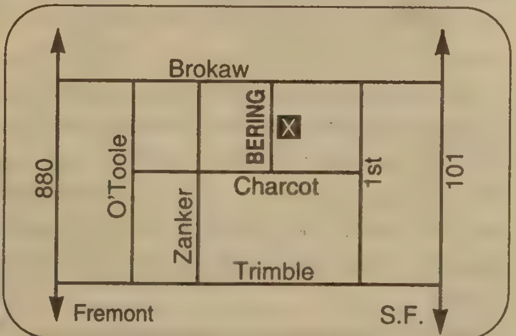
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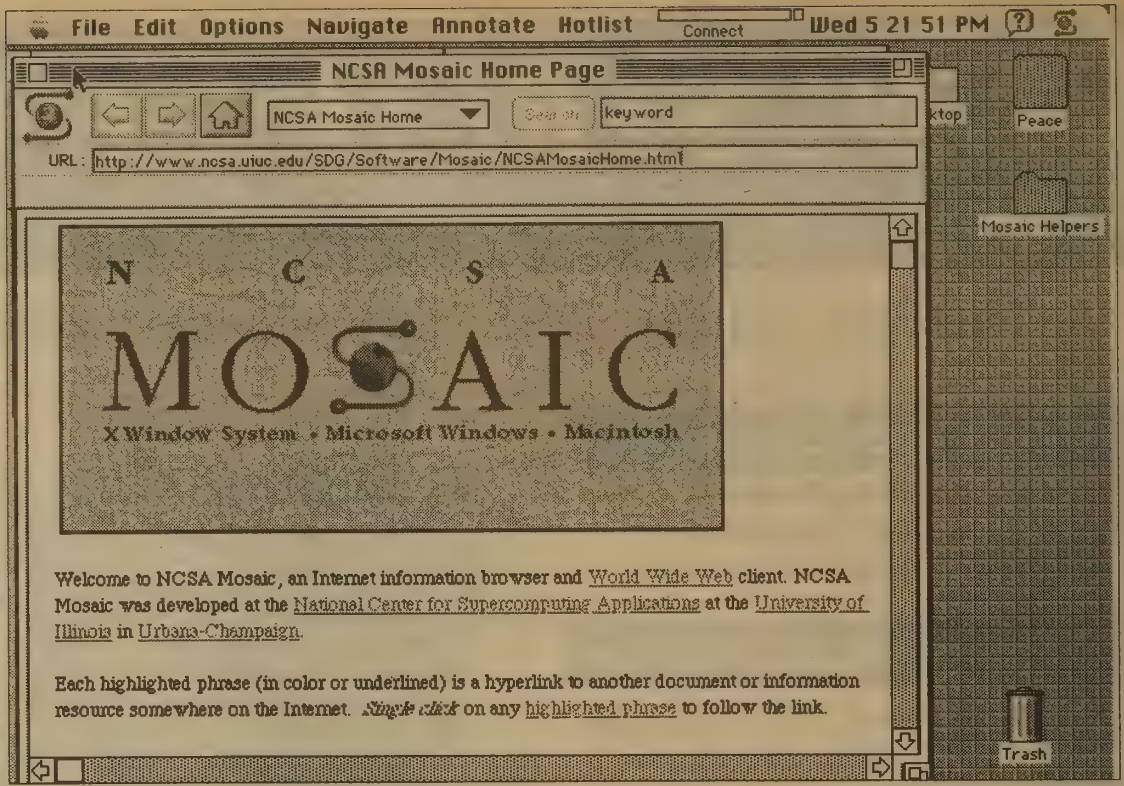
MOSAIC & NETSCAPE *continued...*

export adheres to that limit.

Inside the US we can do anything we want in terms of how strong to make the encryption, so we are making the encryption very strong using very long key lengths, 128-bit RC4, which is virtually unbreakable using any technology projected out for the next ten or twenty years.

This puts you in a situation of having one hand tied behind your back, especially in competing with European vendors.

There is no question that we are hampered in competing with companies outside the United States that will be able to bring to market stronger forms of encryption. It puts us at a huge disadvantage.



Welcome to NCSA Mosaic, an Internet information browser and World Wide Web client. NCSA Mosaic was developed at the National Center for Supercomputing Applications at the University of Illinois in Urbana-Champaign.

Each highlighted phrase (in color or underlined) is a hyperlink to another document or information resource somewhere on the Internet. *Single click* on any highlighted phrase to follow the link.

NCSA Mosaic joined the power of the World Wide Web with a graphical interface to launch the latest wave for computer networks.

Today Netscape Comm. is announcing its latest agreement, this one with Bank of America. Can you tell me about it?

They are participating with us in making it easier for businesses and consumers to do real live commerce over the Net. I don't think this is the final draft, but the quote in here is:

> "We researched payment options available for the Internet and found Netscape Communications is providing the fastest, most secure, and most open environment for online payment processing. Other payment options on the Net come with high transaction risks, bypass bank payment systems, and open the way to fraud and consumer liability. This approach eliminates those concerns and allows companies and consumers to feel comfortable and confident conducting business on the Internet." (Sharif Bayyari, senior vice president of Bank of America)

That sort of sums up what we've been trying to do. With relationships like this we, in collaboration with companies like Bank of America and First Data, can offer businesses the ability to put up services that people can go to and then let those people engage in commerce over the Net without having to worry about any of the risks and without having to go through any particular amount of overhead to do it.

One of your other big announcements was with MCI and its internetMCI service. Is this part of bringing the Internet the last mile into the home?

This is a couple different things. The announcement they made is fairly broad based. It is mainstream Internet access with 400–450 points-of-presence on the MCI network as well as providing direct Internet feeds to their business customers, such as T-1 or frame relay connections. But even more than that, they took a very broad view of the concept of Internet service. With internetMCI and marketplaceMCI they are trying to enable an environment for commerce to take place. There are quite a lot of higher-level services they want to offer on top of this basic infrastructure.

We are integrating their back-end system for marketplaceMCI, along with front-end software, the more vanilla server software, and security approaches. This in turn ties into the credit card clearing and other financial work that we are doing. The object is not that MCI is the only game in town. But companies like MCI are able to offer very broad-base, very efficient, very economical service and really start to make this whole environment more broad based.

For a lot of the existing Internet service providers, who have historically been fairly small and often geographically isolated, this is not necessarily a wonderful announcement. But at the same time this should mean that access to the Net for everyone will be more widespread and much easier to set up. I also think in the long run access is going to be much cheaper.

Companies that actually control the wires, that own the networks, are going to have an edge over companies that buy time on the wires from those same infrastructure companies to provide services. But for the Net to keep expanding and to become an enduring piece of the national infrastructure, a lot of these things have to happen. There has to be nationwide access. There has to be mechanisms for businesses to feel safe and secure. There has to be much higher bandwidths.

Since the Net is international, how do Netscape and Netsite deal with other languages and systems?

Our products will be fully internationalized in the 1995 time frame. It is not only a huge market, exploding in Europe and particularly in Japan, but there is no reason for English to be the only language that is out there.

How does it handle non-Romanic languages?

Not very well. We are doing the work that is required for 16-bit character sets and localization.

At this point are characters bit-mapped? How did Mosaic handle equations and scientific symbols?

It didn't at all. It just let you throw up images. In fact that is what you can do today. If you go out on the Net you will see documents in Japanese or Korean, they are just images.

There is nothing that we do that rules out doing, for example, wide character sets other than the fact that in Mosaic the code was just not there. In Netscape it is not there yet, but it will be soon.

Finding things has been a long-standing problem on the Internet. How do you see this changing?

You will notice when you start up Netscape you get a row of buttons. We thought this would be an interesting thing to experiment with. You are able to click on a button, go to a directory, and do a search. Today, and this is characteristic of the Internet, we point to lots of different directories. So your first problem is which directory do you want to use, but you then go out from there.

This reflects something interesting about the environment. The Net is not centralized. It is absolutely chaotic, absolutely out of control. That is one of the great things because nobody is constraining anything that goes on there. There

continued on page 264

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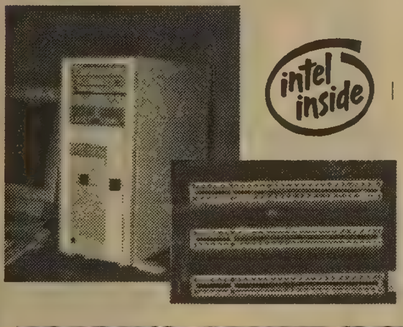
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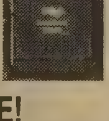

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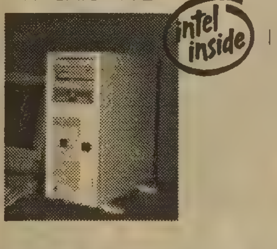
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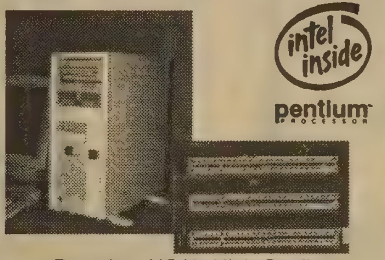
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Providing: Two FIFO Hi Speed
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Three PCI Local Bus Slots Providing a high
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Five ISA Slots (Includes 1 Shared ISA/PCI Slots)
Intel Mercury PCI Chip Set
256K Direct Mapping, write back second level Cache
Intel Pentium 66MHz Processor
Integrated PCI IDE port
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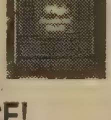
Heat Sink for CPU
Mitsumi High Quality Keyboard
0Mb RAM up to 128MB (72Pin Simms)
NCA's Special 9bay Tower Case
250W UL Power Supply



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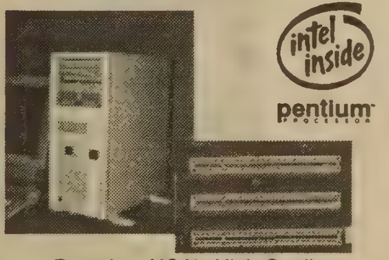
ALEXIS 590PCI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PENTIUM 90MHZ /PCI TOWER SYSTEM

Itegrated SMC37C665 Super I/O Chip
Providing: Two FIFO Hi Speed
Serial Ports/ 1 Parallel Port Bi-Directional
Three PCI Local Bus Slots Providing a high
Bandwidth Data Path
Five ISA Slots (Includes 1 Shared ISA/PCI Slots)
Intel PCI Chip Set
256K Direct Mapping, write back second level Cache
Intel Pentium 90MHz Processor
Integrated PCI IDE port
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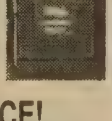

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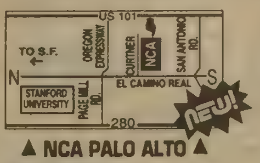
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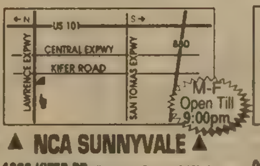
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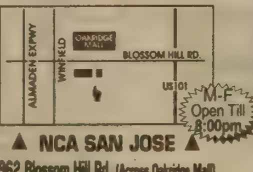
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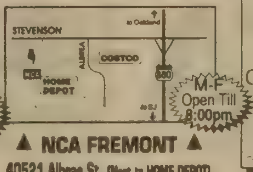
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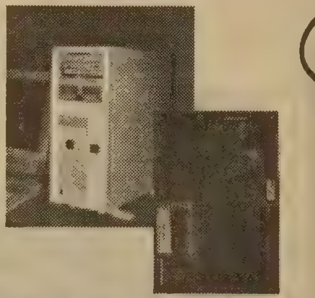

intel inside

486DX/2-66MHZ /VLB TOWER SYSTEM

- Intel DX2/66 CPU
- 1 ISA 8-Bit/2 VESA Local Bus Slots
- 256K Cache exp. to 512K
- 0MB exp. to 64MB DRAM
- Award BIOS
- SIS Chip Set
- ZIF Socket
- Uses 4X30 Pin SIMMS or 2X72 Pin SIMMS
- Green PC Energy Star Compliant
- Teac 1.44M or 1.2M Floppy Drives
- Mitsumi High Quality Keyboard
- NCA's Special 9-bay Tower Case
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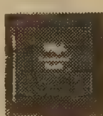

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ALEXIS 4M-2

intel inside

486DX/2-66MHZ /PCI & VLB TOWER SYSTEM

- Intel DX2/66MHz CPU
- 3 PCI Slots
- 4 ISA 16-Bit / 1 ISA 8-Bit
- 2 VESA Local Bus Slots
- 256K Cache
- 0MB exp. to 128MB DRAM
- AMI BIOS
- ALI Chip Set
- ZIF Socket
- Uses 72 Pin SIMMS
- Green PC Energy Star Compliant
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ALEXIS 6M

intel inside pentium PROCESSOR

PENTIUM 60MHZ /PCI & EISA SUPER TOWER SYSTEM

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- 3 PCI Bus Master Slots
- Fast SCSI-II On PCI Local PCI Slot
- 2 Serial, 1 Parallel & 1FDC
- 1 IDE Interface
- 256K Cache
- 0MB exp. to 192MB DRAM
- AMI BIOS
- Intel Mercury Chip Set
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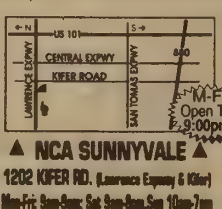

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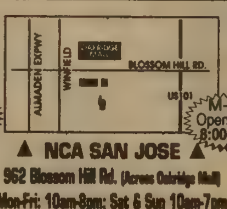

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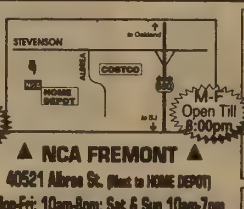

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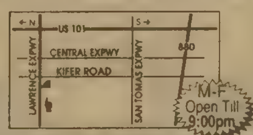
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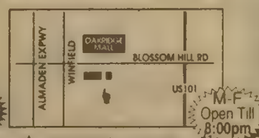
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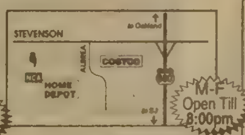
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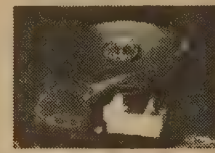

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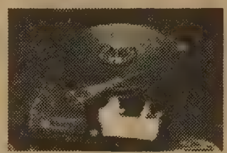

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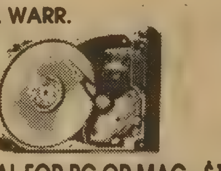

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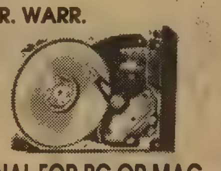

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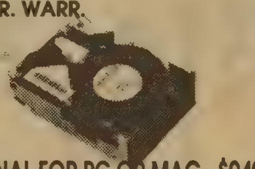

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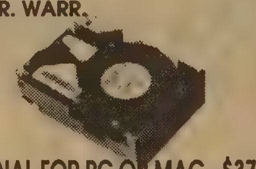

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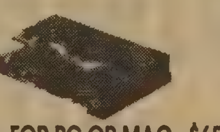

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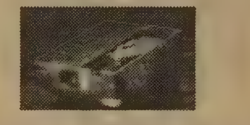

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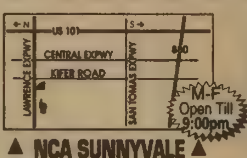
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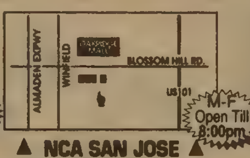
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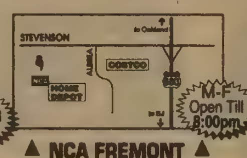
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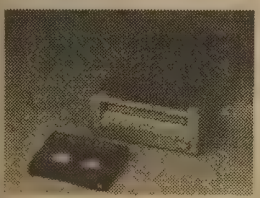

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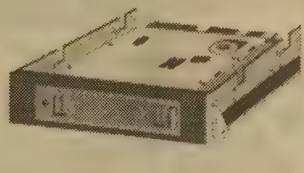

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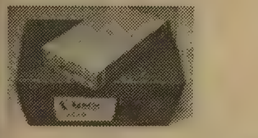

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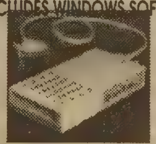

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- ONE DATA CARTRIDGE

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- UP TO 680MB USING COMPRESSION
- 200MB BACKUP IN ABOUT 40 MINUTES
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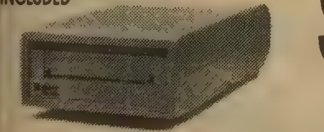

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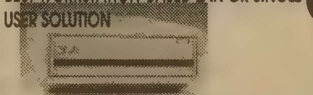

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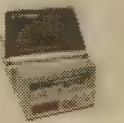

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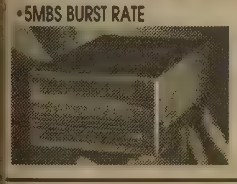

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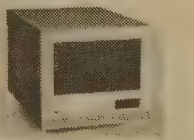

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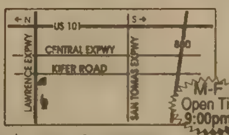
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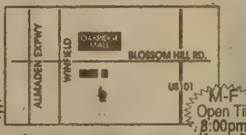
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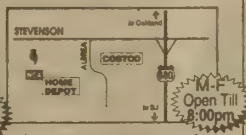
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- System & Network compatible
- Includes Filesafe First software

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- Includes SummitSafe software

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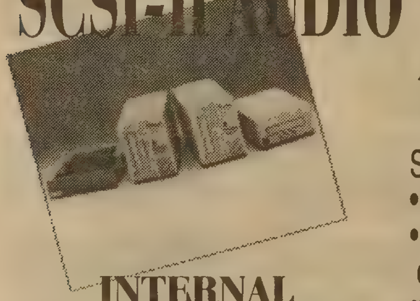

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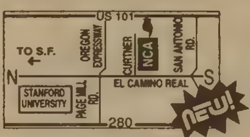
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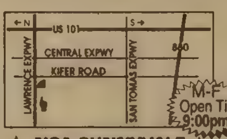
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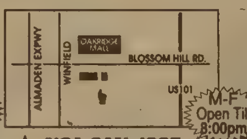
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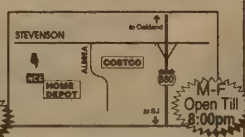
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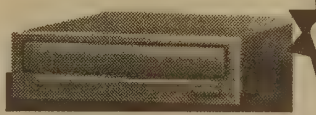

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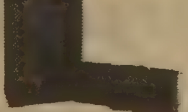

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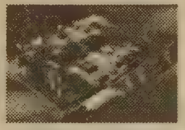

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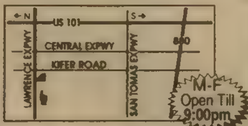

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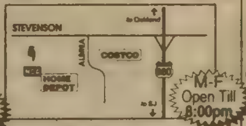

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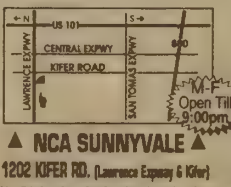

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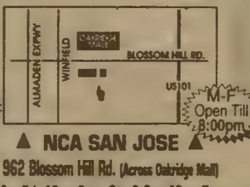

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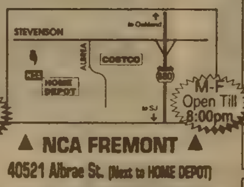

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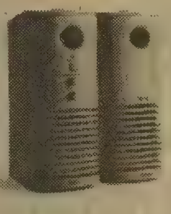

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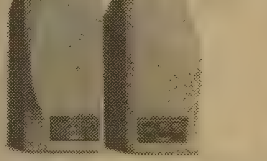

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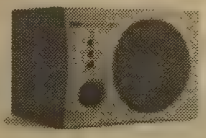

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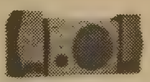

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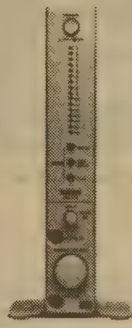

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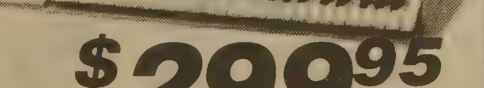

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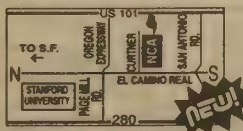

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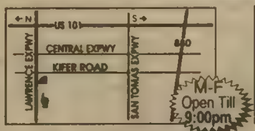

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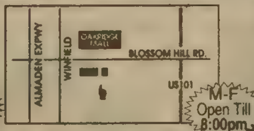

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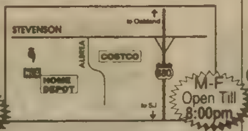

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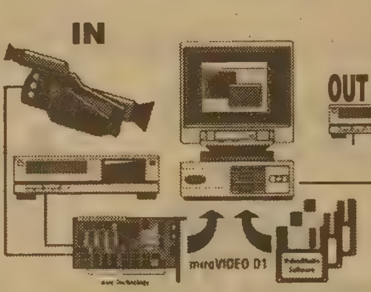

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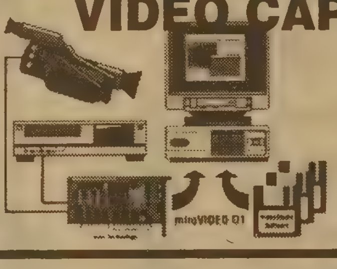

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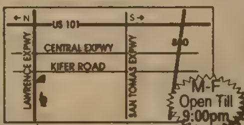

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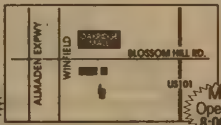

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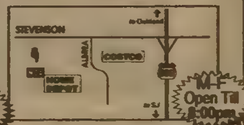

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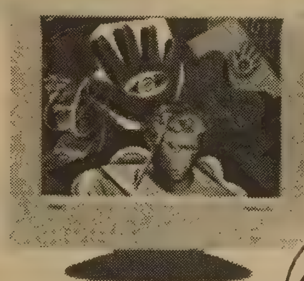

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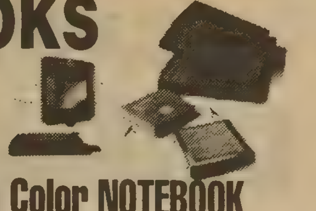

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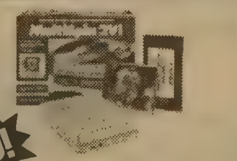

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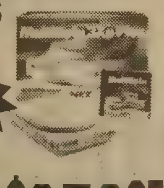

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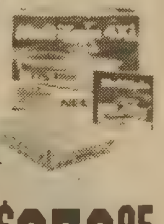

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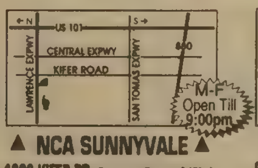

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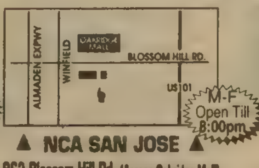

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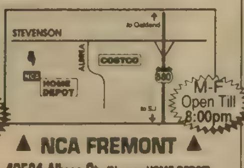

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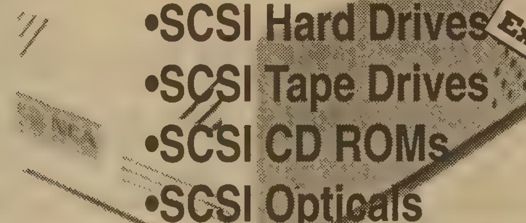

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- Auto contrast
- Color calibration
- Three Year Warranty

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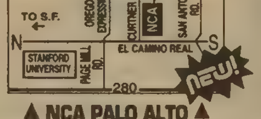

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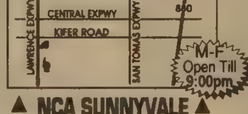

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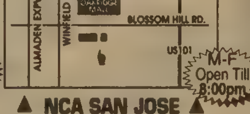

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A Breakthrough in video Technology: Video Caching!

- 128KB Video Cache (exp. 256KB)
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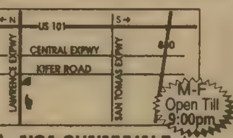
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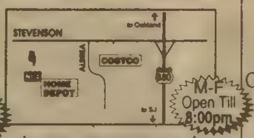
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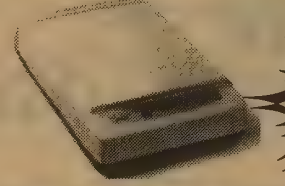

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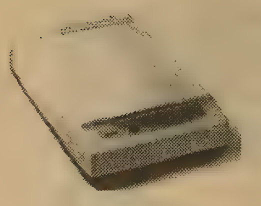

July, 1994

PC World's "Best Buy" (July 1994)
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UC630

Choice Color Scanning Solutions

- Legal size scanning area
- De-screening, Auto-density adjustment, filtering function
- Choice of two exciting software bundles
- TWAIN compliant
- Built in SCSI-II interface w/128K bus caching buffer
- Optional ADF and UTA

PC Software
- Adobe Photoshop LE
- Omni Page Direct
- SCSI int. card & cable
- Standard power cord
- Twain Driver

MAC Software
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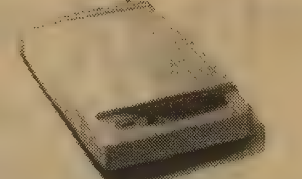
- Omni Page Direct
- SCSI cable & terminator
- Power cord

$555⁹⁵



UC-1260

High Resolution Color Scanner

- Legal size scanning area
- De-screening, Auto-density adjustment, filtering function
- Choice of two exciting software bundles
- 2400dpi high resolution
- TWAIN complaint
- Built in SCSI-II interface w/2mb bus caching buffer
- Optional ADF and UTA

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- Adobe Photoshop Full Version
- Ultra View-interpolation software 2400dpi
- Kai's Power Tools
- SCSI cord/cable
- TWAIN

MAC Software
- Adobe Photoshop Full Version
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- MagicMatch color management system
- Optional UTA

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- SCSI card/cable
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- Omni Page Direct
- SCSI cable & terminat
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True Color Image and Text Scanning

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- Full size scanning pad with edge guide
- Image editing
- Image manager/browser
- OCR recognition
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- Connect your PC or Mac to any standard TV(NTSC c PAL); what you see on the monitor shows up on the large-screen TV
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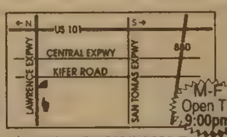

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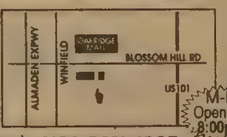

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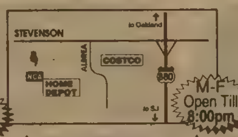

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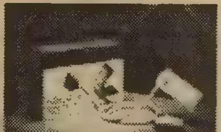

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fast, easy way to connect SCSI devices to your portable or desktop PC's parallel port

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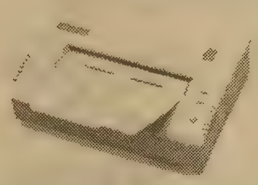

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SF6CD01B

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- TWAIN compatible
- No AC power required
- 24-bit processing
- Access to 16.8 million colors
- Single pass scanning
- Small foot print
- Auto diagnostic installation
- 30 page auto document feed
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- Single pass scanning
- Small foot print
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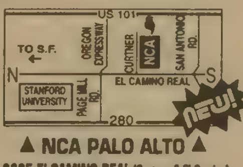

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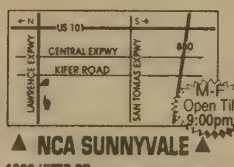

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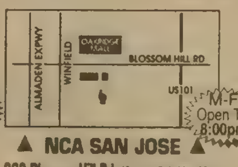

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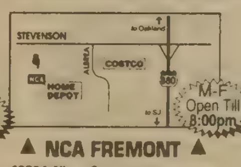

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- Includes PrecisionPointer™ driver software that automatically adjusts resolution from 50 to 1000 dpi for quick movement and precise control.

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Bus Version	$99⁹⁹
PS/2 Mouse Port Comp.	$79⁹⁹

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TRACKBALL

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MacTRAC 2.0

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DELUXE MODEL
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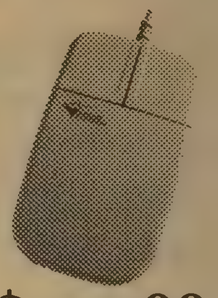

- 2-Button Serial
- High Resolution 350dpi
- Ergonomic Design
- Buttons re-assignable for left or right handed
- Ultra-Res ballistic acceleration
- Includes mouse pad
- Designer pop-up menus

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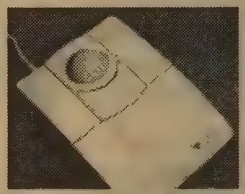

- 3-Button Trackball
- High Resolution 680dpr
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- Ultra-Res ballistic acceleration

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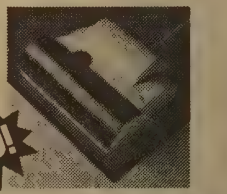

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ALTES 2-button affordable mouse........................ $9⁹⁹

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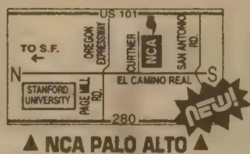
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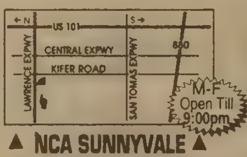
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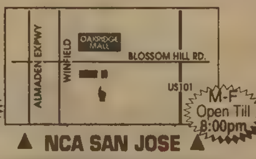
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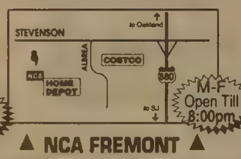
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$89 95 FOR PC

Turbo Mouse 4.0

FOR MAC

- Award-Winning technology outperforms other trackballs and mice
- Superior hardware design for overall comfort and durability
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- Seven button functions and cursor keys maximize mouse performance
- Enhanced software enables custom acceleration for accurate cursor movement

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- Pixel by pixel cursor control with new Slow Cursor Tech-ology
- Custom acceleration to match the way you work
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- Large, comfortable ball
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- Durable stainless steel bearings
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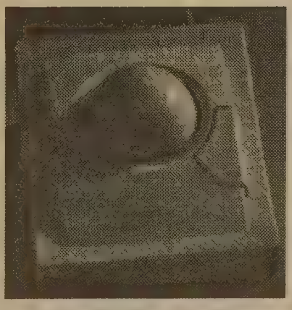

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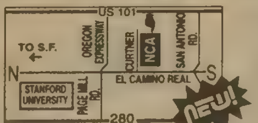
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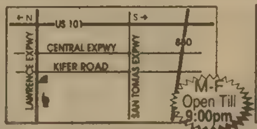
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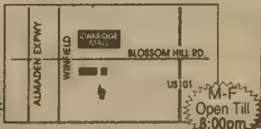
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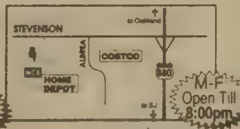
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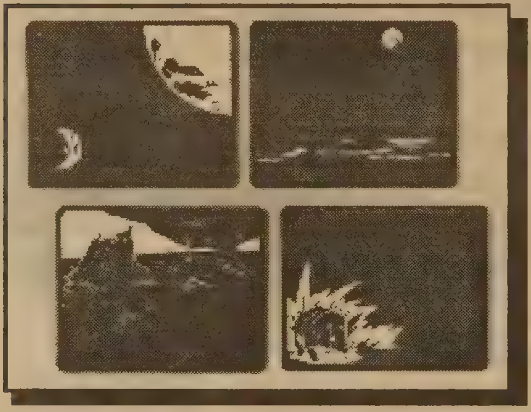
Puzzle Wrist Pad 3.0 & Mouse Wrist Pad 3.0



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6300	Puzzle Wrist Pad 3.0	$7.95
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Get 2 Ethernet media on board with the Ether TnT (Thick & Thin Coax) and Ether TwP (Thick and 10Base-T). The EtherAl (all-in-one)adapters offer three media: 10Base-T, Thin Coax and Thick connections. All Sonic Ethernet adapters are 100% Apple EtherTalk driver compatible and are fully System 7, TCP/IP, DECNet & AU/X compatible. The Ether TWP & TnT adapters are available for the Mac LC family (including the Quadra 605 & Color Classic), the Mac II family & the Quadra family.

The Ether A1 adapters have 64K of on-board SRAM for faster transfers & are available for the Mac SE, SE/30, IIsi, LC family, & Quadra family. The microSCSI line offers both Thin Coax & 10BaseT Ethernet connections for PowerBooks & slotless Macs.

Transceivers & Hubs

Sonic's Apple AUI transceivers are an economical & easy means to connect Macs & printers with built-in Ethernet to the network. 10Base-T, Thin Coax, or A1 (both 10Base-T & Thin Coax)media options are available.

HubLite is the ideal five port Ethernet hub. Its compact size & affordability make it perfect for adding additional nodes to an existing twisted pair Ethernet network. Need more ports than HubLite offers? StarBase T/9 is the answer: a nine port hub in an economical, compact package.

microPrint LocalTalk to Ethernet Hardware Bridge

Now that you have your Macs connected to Ethernet, what do you do with LocalTalk devices like printers & modems? The microPrint series of pocket sized LocalTalk to EtherTalk bridges connect LocalTalk devices to the EtherTalk network. For example, microprint will allow Ethernet users to print to LocalTalk printers such as Apple's LaserWriter, HP 4MP & Deskwriter 550C; Macs on Ethernet can access other shared LocalTalk devices; LocalTalk based Macs can access Ethernet based file sharing & printing devices.

Three versions are available, all of which are compatible with all Macs from the Mac Plus to the PowerMac; microPrint supports two LocalTalk devices; microPrint+ supports twelve LocalTalk devices; and microBridge TCP/IP supports twelve LocalTalk devices and IP services such as Telnet, NFS, FTP and Internet mail from LocalTalk based Macs.

The Bridge Series LocalTalk to Ethernet Software Bridge

The Bridge Series consists of five software packages which allow LocalTalk devices to be hooked up to any extended network (such as Ethernet, TokenRing, ISDN, FDDI, etc.) with no additional hardware. Password protection can be set on the LocalTalk based Macs & printers which are connected via the Bridge Series software so that only certain users are allowed access to these devices, LaserBridge allows up to 10 LocalTalk printers to be daisychained to a host Mac. PowerBridge allows one Mac or printer to be on the network and is ideal for Macs such as the PowerBooks, Classics or any other portable Mac which does not have an Ethernet or Token Ring card, SuperBridge allows up to 10 devices (Macs, printers, etc.) to be daisychained with standard LocalTalk cabling to a host Mac ont eh network.

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Thick + 10Base-T Ether TwP Mac II	$149
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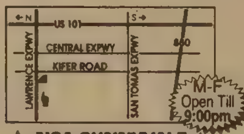

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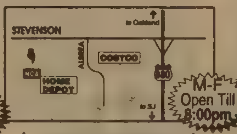

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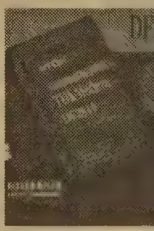

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C VERSION KB-PC09
lly functional computer keyboard
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Connect up to 8 LocalTalk printers or other devices to an Ethernet network! Mini EtherPrint and Mini EtherPrint Plus are the most recent additions to Dayna's award-winning EtherPrint product line. This highly compact design provides options for connecting up to 8 LocalTalk devices directly to your thin ethernet network, or to one port on your 10BASE-T hub. All popular makes of LocalTalk printers are supported. All models also include Dayna's Security protection software for easy network management. Buy from the market leader and get Lifetime Warranties.

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EP0131	Mini EtherPrint-T	10T	2 devices	$CALL
EP0430	Mini EtherPrint Plus	10T, thin	8 devices	$CALL
EP0431	Mini EtherPrint-T Plus	10T	8 devices	$CALL
EP0123	EtherPrint-3	10T, thin, thick	2 devices	$369.95
EP0423	EtherPrint-3 Plus	10T, thin, thick	4 devices	$429.95

DaynaPORT EasyNet/EasyNet-T Transeivers

Provide an easy cost-effective solution for connecting any Macintosh or peripheral with an Ethernet port to 10BASE-T or thin Ethernet networks. Measuring only 1.3"x1.4"x.85" and weighing just 2oz., EasyNet Transceivers are the ideal choice for mobile network users. And, they're plug and play-there's no software to install. Backed by Dayna's Lifetime Warranty and free technical support.

Prod #	Description	Connections	Price
DP0710	EasyNet	BNC (thin)	$CALL
EP0131	EasyNet-T	RJ45 (10-BASE-T)	$CALL

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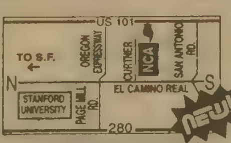

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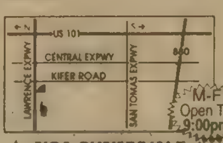

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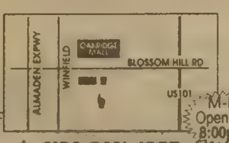

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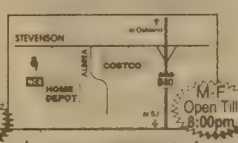

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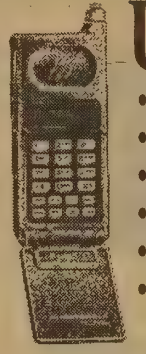

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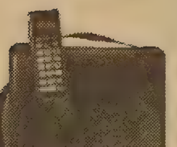

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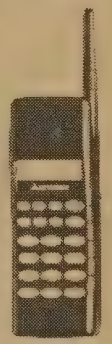

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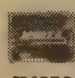

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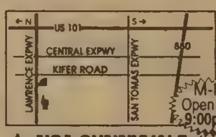

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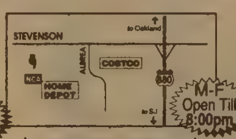

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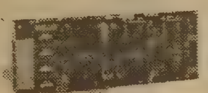

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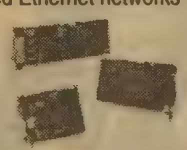

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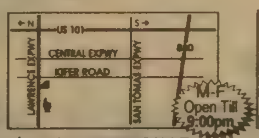

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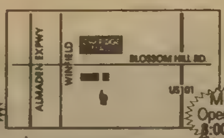

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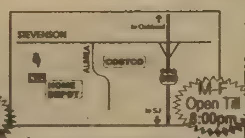

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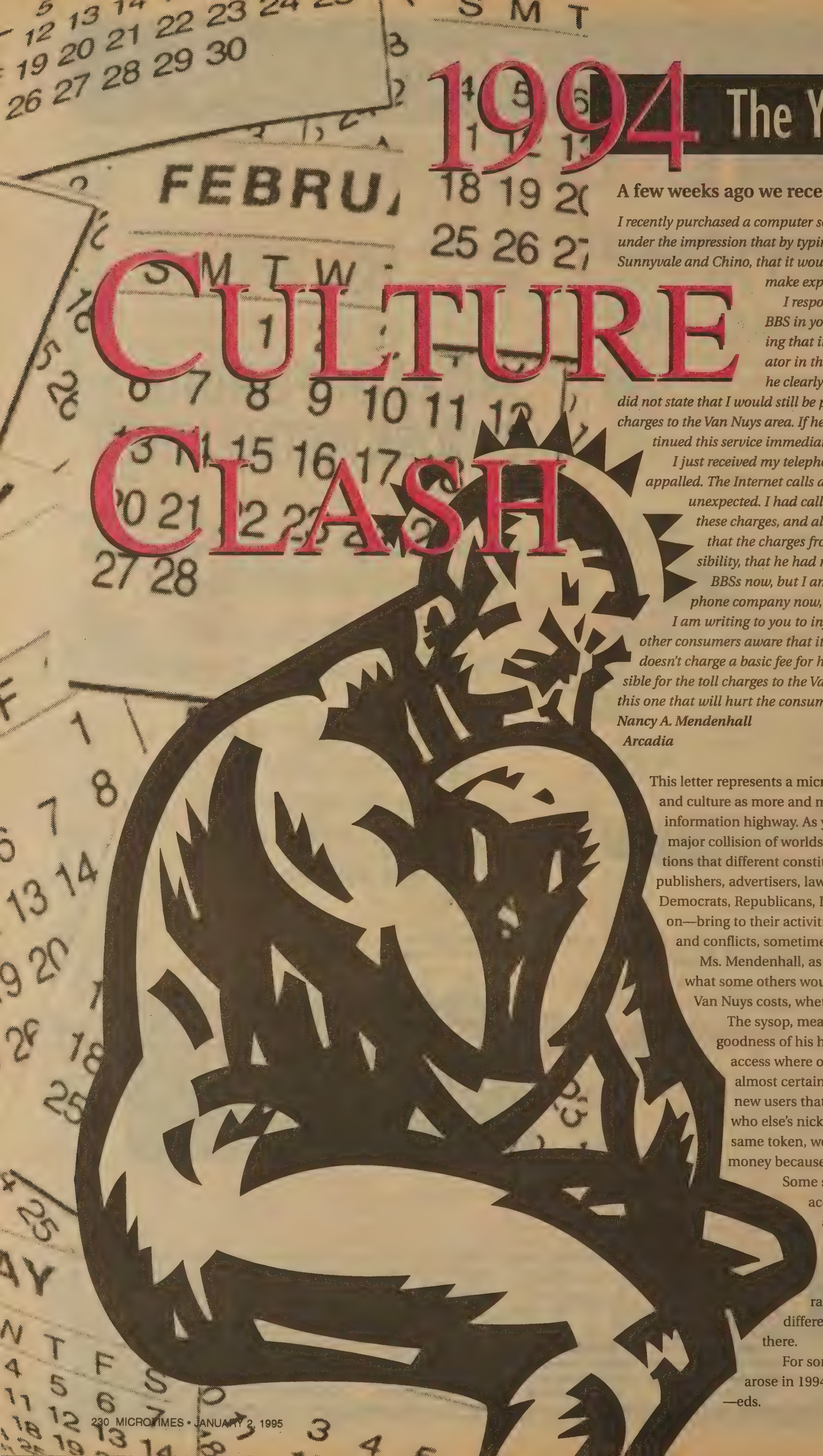
1994 The Year In Review

CULTURE CLASH



A few weeks ago we received the following letter:

I recently purchased a computer so I could get involved with the Internet. I was under the impression that by typing letters back and forth to cities such as Sunnyvale and Chino, that it would save me money rather than having to make expensive telephone calls.

I responded to an advertisement for a Van Nuys BBS in your newspaper. The ad is misleading in stating that it is "free." I had spoken with the system operator in the very beginning of starting this service, and he clearly stated there was no fee for this service. He did not state that I would still be paying the telephone company for toll charges to the Van Nuys area. If he had stated this earlier, I would have discontinued this service immediately and found a more local number to use.

I just received my telephone bill amounting to $300, and was totally appalled. The Internet calls amounted to $155, charges that were totally unexpected. I had called the sysop and spoken to him regarding these charges, and all he did was state that his service is free, but that the charges from the phone company were not his responsibility, that he had no control over that issue. I will be switching BBSs now, but I am still having to pay this full amount to my phone company now, which is totally unfair.

I am writing to you to inform you of this misleading ad to make other consumers aware that it is not a totally free service. That even if he doesn't charge a basic fee for his service, the consumer will still be responsible for the toll charges to the Van Nuys area. Please stop misleading ads like this one that will hurt the consumer financially.

Nancy A. Mendenhall
Arcadia

This letter represents a microcosm of the violent clash of expectations and culture as more and more of the general population hits the information highway. As you'll see in the articles that follow, there's a major collision of worlds in cyberspace, and the varying assumptions that different constituencies—professors, students, lawyers, publishers, advertisers, law enforcement, scientists, telecommuters, Democrats, Republicans, Libertarians, Christians, pagans, and so on—bring to their activities cause often-painful misunderstandings and conflicts, sometimes irreconcilable.

Ms. Mendenhall, as a new user, seems not to have realized what some others would have—that a phone call from Arcadia to Van Nuys costs, whether a computer or a human makes it.

The sysop, meanwhile, was running the BBS out of the goodness of his heart and at his own expense, allowing free access where others would charge user fees. It would almost certainly not have occurred to the sysop to warn new users that they were calling on their own nickel—who else's nickel *would* they be calling in on? (By the same token, we're a free magazine, but subscriptions cost money because we have to pay the Post Office.)

Some services get around this problem with local access numbers, but such services almost always charge for usage.

With just such glowing expectations as Ms. Mendenhall we sally forth into a brave new digital world. And with just such outrage we encounter new neighbors with very different ideas of how things ought to be run there.

For some perspectives on such conflicts that arose in 1994, read on.

—eds.

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IQ And PCs

By Rich Karlgaard

By now the critics and the mainstream press have piled on *The Bell Curve: Intelligence and Class Structure in American Life.* In case you've been on a space shuttle or vacationing in a rain forest, this is the book by Charles Murray and the late Richard Herrnstein about IQ. The authors unashamedly assert a tightening link between high IQ and a successful adult life.

The fur is really flying over this. Before his death from lung cancer this summer, Herrnstein's classes at Harvard were often crashed by noisy protesters. Murray, a conservative with the American Enterprise Institute, is character-assassinated as a fascist, or at least an unwitting aid to eugenicists.

Later, we'll say why we think Murray is stunningly wrong. First, he needs to be defended. Murray is saying what many of his left-leaning colleagues have long held to be true. Three years ago Mickey Kaus, a contributing editor to the *New Republic*, wrote *The End of Equality*, a book asserting the same thing. Kaus's logic: Smart means rich. The smart are interbreeding more. Ergo, the smart/rich will become smarter/richer, and the dull/poor will become alienated, desperate, and dangerous.

Before he became labor secretary, Robert Reich wrote a book called *The Work of Nations.* He claimed that only 20% of the population were suited for the information age. He called them symbolic analysts—programmers, lawyers, filmmakers, stockbrokers, and the like. Reich said these eightieth-plus percentilers (IQ of 115 and above) were "seceding" from the rest of America. Alarmingly, he said, they live in suburbs or yuppified city enclaves, work in high-rises or office parks, and send their kids to private schools.

> IQ IS A VERY ROUGH SORTER OF SUCCESS. ENTERPRISE ITSELF IS MUCH BETTER. GO TO ANY MENSA MEETING (OR TO ANY COLLEGE SOCIAL SCIENCES DEPARTMENT). IT'S FULL OF CRANKS AND HIGH DOMES ANNOYED AT THE WORLD FOR NOT REWARDING IQ AS RICHLY AS MARKET SKILLS.

From left to right, from Reich to Murray, IQ angst is on the rise. And there is enough truth to buy into their concerns, which go like this:

- The information age rewards smart people.
- Really smart people, armed with powerful computers and broadband networks, can leverage more capital and assets than whole companies of chowderheads can.
- Thus, really smart people are in a position to create a hugely disproportionate amount of the global booty in the years ahead. (Question: Is this bad? Who better to deploy capital to new job-creating ventures than those who created it in the first place?)

Of course, Murray, Kaus, and Reich paint a different picture—a dangerous skewing of wealth and poverty, "mansions on the hill, slums below." That would be a bad thing. The danger is that these Cassandras on the left and right may finger PCs and broadband networks as a contributor, not a solution, to the IQ gap.

Any Rich Mensans?

Let's talk about IQ. Count me as a conservative who allies with the liberals on this matter of IQ.

As a measure of intelligence, IQ is full of problems. Sure it can separate Gump from Gates, but so could Jeopardy. Can it reliably delineate people within closer ranges? (No.) Does it overreward left brain vs. right, speed

continued on page 268

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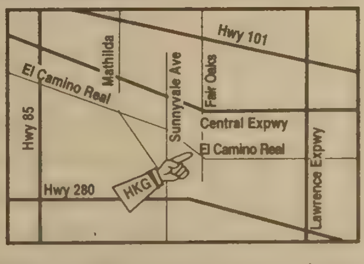

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The PC Police And The Chilling Effect

Strange Times And Arrested Development In Santa Rosa

BY CYNTHIA DYER-BENNET

•In 1993, Senator Carol Moseley-Braun, (D-IL) demanded her "fundamental right to freedom from insult" from Senator Jesse Helms (R-NC) because he whistled "Dixie."

•A motorist in Norway called a policeman an "onion," and was fined the equivalent of $790 US for uttering an illegal affront.

•A huge flap resulted when a male student yelled "water buffalo" at a noisy female on a Midwest campus.

> The trio said the college had failed to keep its students from creating a hostile learning environment because it did not stop online students from posting insulting remarks about them.

The PC Police are on the march—down the halls of our legislature, in our courtrooms, and now, goose-stepping through the halls of academia, driven by the apparent belief that any negative commentary is just cause to put a lid on freedom of expression.

Ludicrous as these examples may seem, they are paralleled closer to home. Recently, Santa Rosa Junior College paid three students $15,000 apiece because they had been textually insulted by a handful of other students on an electronic bulletin board.

A Little History

It all started in the spring of 1993, my first semester back at school after twenty-five years in the workforce. I had enrolled in the four-semester journalism program at SRJC, and was working on *The Oak Leaf*, the student-run campus weekly newspaper.

One of the vital tools of the *Oak Leaf* was a small electronic network called SOLO (Super Oak Leaf Online), established a year before by journalism instructor Roger Karraker. It was used primarily by *Oak Leaf* staff members to communicate about story assignments, for file transfer, and the private email.

SOLO was used by about 350 students on a campus of approximately thirty thousand. Due to hardware limitations, usage of the system was restricted to those in journalism classes and a few other sections, such as media and art courses. It was roughly divided between course-related conferences and a section of conferences called "Free Speech."

At the urging of several online women, Karraker formed the Women's Only Conference, a place for female SOLO users to discuss issues of interest to women. Karraker also established the Men's Only Conference to avoid claims of gender discrimination. Both conferences had specific rules which members had to abide by: Membership was gender-restricted; nothing said inside the conferences was to be discussed outside them; postings within these conferences were not to be printed out in hard copy.

The trouble began offline. SRJC student Lois Arata launched a boycott of the *Oak Leaf* over a thong bikini ad we published, saying it demeaned women. Not unlike ex-Sheriff Hongisto, she started removing our papers from the newsstands and returning them to the *Oak Leaf* office. She even convinced some administrators to refuse to allow our paper to be distributed in their departments.

These actions did not go unnoticed by *Oak Leaf* staff members. But nobody wanted to file a claim against Arata for infringing on the freedom of the press. Instead, discussions were launched on SOLO, some of them quite angry one-sided discussions—nobody online spoke up to say that Arata's behavior was appropriate.

Meanwhile, *Oak Leaf* staffer Jennifer Branham was going through a breakup with another staff member, Dan Katz. She posted hostile remarks about Katz in public conferences. In the MOC, which contained ten members, Katz posted crude remarks about Branham. Remarks were also posted there about Arata; most were commentaries on her "boycott," but a few were crude and personal.

Dylan Humphrey, an ex-staffer on the *Oak Leaf* and a member of the MOC, broke the rules of confidentiality and told the two women what was being said.

Branham brought hard copy of the posts, which Humphrey says he gave her, to Karraker, who promptly closed down both the MOC and WOC.

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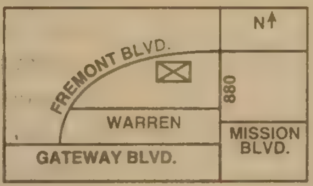

GOLDEN MICRO COMPUTERS

Karraker removed Humphrey from SOLO for breaking the confidentiality of the MOC.

Humphrey joined forces with Branham and Arata. They took their complaints to SRJC administrators, saying that they were all suffering from "retaliation" and a "hostile learning environment," and that the two women were also suffering from sexual harassment.

Dr. Robert Agrella, president of SRJC, put Karraker on administrative leave for the final four weeks of the semester while the college looked into the matter. The college hired a private investigator to sift through the details of the case. Shortly after Karraker was put on administrative leave, from which he was not allowed to return until the following September, Arata demanded and was given an account on SOLO to defend herself.

The OCR has determined that the college is responsible for the remarks of its students. It has censured the college for not stopping students from saying disagreeable things and insists that it do so in the future.

Arata's boycott was attacked vigorously online. A few students also attacked her on a personal level. She was called a feminazi and a fundamentalist feminist. She called her attackers equally florid names and quit the board.

The Issues

The trio complained to the college that the two small gender-specific sub-conferences on a campus BBS violated Title IX of the federal Department of Education's codes. Title IX states that educational facilities cannot establish educational programs on the basis of gender.

Not satisfied with Karraker's prompt closure of the conferences when the offending remarks were brought to his attention, or with the college's subsequent investigation, the claimants took their objections to the Department of Education's Office of Civil Rights. They said the college had failed to keep its students from creating a hostile learning environment because it did not stop online students from posting insulting remarks about the trio.

The OCR ruled that the gender-specific conferences were in violation of Title IX. It also ruled that the college was responsible for protecting its students from expressions of hostility by other students, and proposed a set of guidelines for online conversation. SRJC paid the claimants $45,000 and has implemented the OCR's suggested conduct rules.

This sounds reasonable, doesn't it? But a closer inspection of the issues shows otherwise.

We first must look at the concept that gender-specific programs are illegal in federally funded educational facilities. The college had, from the early '70s until the mid-'80s, a program called Women's Reentry, which provided services to displaced housewives. Yet no comparable program was established for men at that time, despite the fact that Title IX has been in place since the early '70s. It was not until the mid-'80s that the program was renamed Reentry Services.

SRJC currently has programs in the physical education department that are gender-specific. The college even has a women's volleyball team with no comparable men's volleyball team, yet the OCR seemingly has no problem with this.

Secondly, how is it that a pair of gender-specific conferences that were entirely voluntary, that were not part of any course requirement, and that were formed at the request of online students, can be considered discriminatory? Are locker-room conversations a violation of Title IX because both genders cannot participate? The notion that the existence of two voluntary gender-specific conferences among two hundred other choices online constitutes discrimination is absurd.

Thirdly, the OCR has determined that the college is responsible for the remarks of its students. It has censured the college for not stopping students from saying disagreeable things and insists that it do so in the future. But short of hiring two full-time administrators to read each and every post prior to releasing it to the online students, there really is no way to stop students from saying offensive things now and again. Additionally, by assuming culpability for the words of its voting-age students, the college keeps its students in the position of children, at a time when they should be learning the responsibilities of adulthood. What kind of lesson is that?

Lastly, the OCR threatened to withhold federal funds if SRJC did not knuckle under to its demands. The rules of conduct that the OCR insists upon include fuzzy regulations which forbid "acts that purport to be 'jokes' or 'pranks,' but that are hostile or demeaning."

We all know that online folks can be touchy. Even the most bland of witticisms can be construed by the overly sensitive as a personal slam. The flame wars that can be touched off by the smallest spark of humor can escalate quickly into a full-blown conflagration.

And how are these fires quenched in the adult world of cyberspace? By discussion. By thrashing out the details until a consensus is reached. Certainly not by disallowing dumb blonde jokes or jibes at lawyers.

OCR Speaks

After thirteen months, the OCR released its ruling.

In regard to Arata's claim that she was the victim of retaliation, the OCR ruled that the college was guilty of "failing to take adequate steps to stop the retaliation."

Yet the OCR report notes that "the administrator who created Arata's SOLO account warned her that she would receive hurtful messages." It also acknowledges that Karraker admonished students who made personal attacks against Arata, telling them to stick to the issues.

What was the college supposed to do? Should Arata alone have been allowed to fling insults, and those who held opposing viewpoints been forced to quell their passionate views?

Branham claimed she was subject to a retaliatory hostile environment by student members of the *Oak Leaf* staff and that SRJC did not respond adequately to the harassment. The OCR ruled in her favor.

The OCR notes the following as an example of student retaliation: "A couple of days after the journalism professor's removal, someone affixed flyers with the text of the First Amendment all over the *Oak Leaf* office." Further proof of the harassment she suffered, according to the OCR, was the accusation from the staff

continued on page 314

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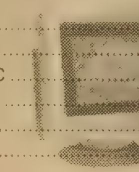

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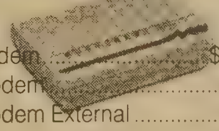

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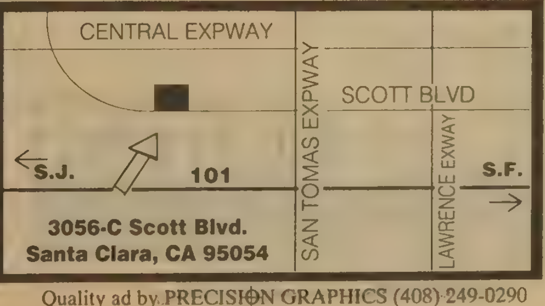

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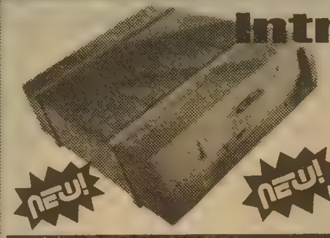

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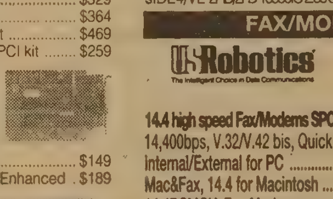

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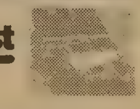

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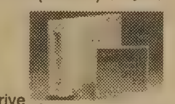

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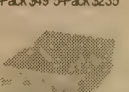

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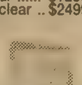

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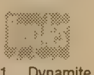

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The State Of Computer Crime

Speech To High Technology Crime Investigation Association
Lake Tahoe, November 1994

BY BRUCE STERLING

People in law enforcement often ask me, "Mr Sterling, if you're a science fiction writer like you say you are, then why should you care about American computer police and private security?"

Why did I write *Hacker Crackdown* in the first place? Well, I figured that somebody ought to do it, and nobody else was willing, that's why. When I first got interested in Operation Sundevil and the Legion of Doom and the raid on Steve Jackson Games and so forth, it was 1990. All these issues were very obscure. It was the middle of the Bush administration. There was no information superhighway vice president. There was no *Wired* magazine. There was no Electronic Frontier Foundation. There was no Clipper Chip and no Digital Telephony Initiative. There was no PGP and no World Wide Web. There were a few books around, and a couple of movies, that glamorized computer crackers, but there had never been a popular book written about American computer cops.

> THERE'S WAY, WAY TOO MUCH BLATHER ABOUT TEENAGE COMPUTER INTRUDERS, AND NOWHERE NEAR ENOUGH COVERAGE OF COMPUTER COPS. COMPUTER COPS ARE A HUNDRED TIMES MORE INTERESTING THAN SNEAKY TEENAGERS WITH KODES AND KARDS.

When I got started researching *Hacker Crackdown*, my first and only nonfiction book, I didn't even think I was going to write any such book. There were four other journalists hot on the case who were all rather better qualified than I was. But one by one they all dropped out. Eventually I realized that either I was going to write it, or nobody was ever going to tell the story. All those strange events and peculiar happenings would have passed, and left no public record. I couldn't help but feel that if I didn't take the trouble and effort to tell people what had happened, it would probably all have to happen all over again. And again and again, until people finally noticed it and were willing to talk about it publicly.

Nowadays it's very different. There are about a million journalists with Internet addresses now. There are other books around, like for instance Hafner and Markoff's *Cyberpunk Outlaws and Hackers*, which is a far better book about hackers than my book is. Mungo and Clough's book *Approaching Zero* has a pretty interesting take on the European virus scene. Joshua Quittner has a book coming out on the Masters of Deception hacking group.

Then there's this other very recent book I have here, *Cyberspace and the Law*, by Cavazos and Morin, which is a pretty good practical handbook on digital civil liberties issues. This book explains in pretty good legal detail exactly what kind of stunts with your modem are likely to get you into trouble. This is a useful service for keeping people out of hot water, which is pretty much what my book was intended to do, only this book does it better. And there have been a lot of magazine and newspaper articles published.

Basically, I'm no longer needed as a computer crime journalist. The world is full of computer journalists now, and the stuff I was writing about four years ago is hot and sexy and popular now. That's why I don't have to write it anymore. I was ahead of my time. I'm supposed to be ahead of my time. I'm a science fiction writer. Believe it or not, I'm needed to write science fiction. Taking a science fiction writer and turning him into a journalist is like stealing pencils from a blind man's cup.

So frankly, I haven't been keeping up with you guys, and your odd and unusual world, with the same gusto I did in '90 and '91. Nowadays, I spend all my time researching science fiction. I spent most of '92 and '93 learning about tornadoes and the Greenhouse Effect. At the moment, I'm really interested in photography, cosmetics, and computer interfaces. In '95 and '96 I'll be interested in something else. That may seem kind of odd and dilettantish on my part. It doesn't show much intellectual staying power. But my intellectual life doesn't have to make any sense. Because I'm a science fiction writer.

Even though I'm not in the computer crime game anymore, I do maintain an interest. For a lot of pretty good reasons. I still read most of the computer crime journalism that's out there. And I'll tell you one thing about it. There's way, way too much blather about teenage computer intruders, and nowhere near enough coverage of computer cops. Computer cops are a hundred times more interesting than sneaky teenagers with kodes and kards. A guy like Carlton Fitzpatrick should be a hundred times more famous than some wretched hacker kid like Mark Abene. A group like the FCIC is a hundred times more influential and important and interesting than the Chaos Computer Club, Hack-Tic, and the 2600 group all put together.

The United States Secret Service is a heavy outfit. It's astounding how little has ever been written or published about Secret Service people, and their lives, and their history, and how life really looks to them. Cops are really good material for a journalist or a fiction writer. Cops see things most human beings never see. Even private security people have a lot to say for themselves. Computer-intrusion hackers and phone phreaks, by contrast, are basically pretty damned boring.

Communication Problems And Kevin Mitnick

You know, I used to go actively looking for hackers, but I don't bother anymore. I don't have to. Hackers come looking for me these days. And they find me, because I make no particular effort to hide. I get these phone calls—I mean, I know a lot of you have gotten these hacker phone calls—but for me they go a lot like this:

I DON'T KNOW WHAT KEVIN MITNICK LOOKS LIKE EITHER, EVEN THOUGH I'VE WRITTEN ABOUT HIM A LITTLE BIT, AND MY QUESTION IS, HOW COME? HOW COME THERE'S NO PUBLICLY ACCESSIBLE WORLD WIDE WEB PAGE WITH MUGSHOTS OF WANTED COMPUTER-CRIME FUGITIVES? EVEN THE US POSTAL SERVICE HAS GOT THIS MUCH TOGETHER, AND THEY DON'T EVEN HAVE MODEMS.

Ring ring.

"Hello?"

"Is this Bruce Sterling?"

"Yeah, you got him."

"Are you the guy who wrote *Hacker Crackdown*?"

"Yeah, that's me, dude. What's on your mind?"

"Uh, nothing—I just wanted to know if you were there!"

"Well, okay, I'm here. If you ever get anything on your mind, you let me know."

Click, buzz.

I get dozens of calls like that. And, pretty often, I'll get another call about twenty-four0 hours later, and it'll be the same kid, only this time he has ten hacker buddies with him on some illegal bridge call. They're the Scarlet Scorpion and the Electric Ninja and the Flaming Rutabaga, and they really want me to log onto their pirate bulletin board system, the Smurfs in Hell BBS somewhere in Wisconsin or Ohio or Idaho. I thank them politely for the invitation and I tell them I kind of have a lot of previous engagements, and then they leave me alone.

I also get a lot of calls from journalists. Journalists doing computer crime stories. I've somehow acquired a reputation as a guy who knows something about computer crime and who is willing to talk to journalists. And I do that, too. Because I have nothing to lose. Why shouldn't I talk to another journalist? He's got a boss, I don't. He's got a deadline, I don't. I know more or less what I'm talking about, he usually doesn't have a ghost of a clue. And suppose I say something really rude or tactless or crazy, and it gets printed in public. So what? I'm a science fiction writer! What are they supposed to do to me—take away my tenure?

Hackers will also talk to journalists. Hackers brag all the time. Computer cops, however, have not had a stellar record in their press relations. I think this is sad. I understand that there's a genuine need for operational discretion and so forth, but since a lot of computer cops are experts in telecommunications, you'd think they'd come up with some neat trick to get around these limitations.

Let's consider, for instance, the Kevin Mitnick problem. We all know who this guy Mitnick is. If you don't know who Kevin Mitnick is, raise your hand... Right, I thought so. Kevin Mitnick is a hacker and he's on the lam at the moment; he's a wanted fugitive.

The FBI tried to nab Kevin a few months back at a computer civil liberties convention in Chicago and apprehended the wrong guy. That was pretty embarrassing, frankly. I was there, I saw it, I also saw the FBI trying to explain later to about five hundred enraged self-righteous liberals, and it was pretty sad. The local FBI office came a cropper because they didn't really know what Kevin Mitnick looked like.

I don't know what Mitnick looks like either, even though I've written about him a little bit, and my question is, how come? How come there's no publicly accessible World Wide Web page with mugshots of wanted computer-crime fugitives? Even the US Postal Service has got this much together, and they don't even have modems.

Why don't the FBI and the USSS have public relations stations in cyberspace? For that matter, why doesn't the HTCIA have its own Internet site? All the computer businesses have Internet sites now, unless they're totally out of it. Why aren't computer cops in much, much better rapport with the computer community through computer networks?

You don't have to grant live interviews with every journalist in sight if you don't want to, I can understand that that can create a big mess sometimes. But just put some data up in public, for heaven's sake. Crime statistics. Wanted posters. Security advice. Antivirus programs, whatever. Stuff that will help the cyberspace community that you are supposed to be protecting and serving.

I know there are people in computer law enforcement who are ready and willing and able to do this, but they can't make it happen because of too much bureaucracy and, frankly, too much useless hermetic secrecy. Computer cops ought to publicly walk the beat in cyberspace a lot more, and stop hiding your light under a bushel. What is your problem, exactly? Are you afraid somebody might find out that you exist?

I think that this is an amazing oversight and a total no-brainer on your part, to be the cops in an information society and not be willing to get online big-time and really push your information—but maybe that's just me. I enjoy publicity, personally. I think it's good for people. I talk a lot, because I'm just an opinionated guy. I can't help it.

Since I'm not a cop or a prosecutor, I don't really have much of genuine nuts-and-bolts value to offer to you ladies and gentlemen. It's sheer arrogance on my part to lecture you on how to do your jobs. But since I was asked to come here, I can at least offer you my opinions. Since they're probably not worth much, I figure I ought to at least be frank about them.

True High-Tech Crime Stories

First the good part. Let me tell you about a few recent events in your milieu that I have no conceptual difficulties with.

Case in point. Some guy up around San Francisco is cloning off cellphones, and he's burning EPROMs and pirating cellular ID's, and he's moved about a thousand of these hot phones to his running buddies in the mob in Singapore, and they've bought him a real nice sports car with the proceeds. The Secret Service shows up at the guy's house, catches him with his little soldering irons in hand, busts him, hauls him downtown, calls a press conference after the bust, says that this activity is a big problem for cellphone companies and they're gonna turn up the heat on people who do this stuff.

I have no problem with this situation. I even take a certain grim satisfaction in it. Is this a crime? Yes. Is this guy a bad guy with evil intent? Yes. Is law enforcement performing its basic duty here? Yes it is. Do I mind if corporate private security is kinda pitching in behind the scenes and protecting their own commercial interests here? No, not really. Is there some major civil liberties and free expression angle involved in this guy's ripping off cellular companies? No. Is there a threat to privacy here? Yeah—him, the perpetrator. Is the Secret Service emptily boasting and grandstanding when they hang this guy out to dry in public? No, this looks like legitimate deterrence to me, and if they want a little glory out of it, well, hell, we all want a little glory sometimes. We can't survive without a little glory. Take the dumb bastard away with my blessing.

Okay, some group of Vietnamese Triad types hijack a truckload of chips in Silicon Valley, then move the loot overseas to the Asian black market through some smuggling network that got bored with running heroin.

Are these guys "Robin Hoods of the Electronic Frontier?" I don't think so. Am I all impressed because some warlord in the Golden Triangle may be getting free computation services, and information wants to be free? No, this doesn't strike me as a positive development, frankly. Is organized crime a menace to our society? Yeah! It is!

I can't say I've ever had anything much to do—knowingly that is—with wiseguy types, but I spent a little time in Moscow recently, and in Italy, too, at the height of their Tangentopoly kickback scandal, and you know, organized crime and endemic corruption are very serious problems indeed. You get enough of that evil crap going on in your society and it's like nobody can breathe. A protection racket—I never quite grasped how that worked and what it meant to victims, till I spent a couple of weeks in Moscow last December. That's a nasty piece of work, that stuff.

Another case. Some joker gets himself a job in a long distance provider, and he writes a PIN-trapping network program and he gets his mitts on about eight zillion PINs and he sells them for a buck apiece to his hacker buddies all over the US and Europe.

Do I think this is clever? Yeah, it's pretty ingenious. Do I think it's a crime? Yes, I think this is a criminal act. I think this guy is basically corrupt. Do I think free or cheap long distance is a good idea? Yeah, I do actually; I think if there were a very low flat rate on long distance, then you would see usage skyrocket so drastically that long distance providers would actually make more money in the long run. I'd like to see them try that experiment some time; I don't think the way they run phone companies in 1994 is the only possible way to run them successfully. I think phone companies are probably gonna have to change their act pretty drastically if they expect to survive in the twebty-first century's media environment.

But you know, that's not this guy's lookout. He's not the one to make that business decision. Theft is not an act of reform. He's abusing a position of trust as an employee in order to illegally line his own pockets. I think this guy is a crook.

So I have no problems with those recent law enforcement operations. I wish they'd gotten more publicity, and I'm kinda sorry that I wasn't able to give them more publicity myself, but at least I've heard of them, and I was paying some attention when they happened.

Trouble Spots

Now I want to talk about some stuff that bugs me.

I'm an author and I'm interested in free expression, and it's only natural because that's my bailiwick. Free expression is a problem for writers, and it's always been a problem, and it's probably always gonna be a problem. We in the West have these ancient and honored traditions of Western free speech and freedom of the press, and in the US we have this rather more up-to-date concept of "freedom of information." But even so, there is an enormous amount of "information" today which is highly problematic.

Just because freedom of the press was in the Constitution didn't mean that people were able to stop thinking about what press freedom really means in real life, and fighting about it and suing each other about it.

We Americans have lots of problems with our freedom of the press and our freedom of speech. Problems like libel and slander. Incitement to riot. Obscenity. Child pornography. Flag burning. Cross burning. Race-hate propaganda. Political correctness. Sexist language. Mrs. Gore's Parents Music Resource Council. Movie ratings. Plagiarism. Photocopying rights. A journalist's so-called right to protect his sources. Fair-use doctrine. Lawyer-client confidentiality. Paid political announcements. Banning ads for liquor and cigarettes. The fairness doctrine for broadcasters. School textbook censors. National security. Military secrets. Industrial trade secrets. Arts funding for so-called obscenity. Even religious blasphemy such as Salman Rushdie's famous novel *Satanic Verses*, which is hated so violently by the kind of people who like to blow up the World Trade Center. All these huge problems about what people can say to each other, under what circumstances. And that's without computers and computer networks.

COMPUTERS DON'T MAKE ANY OF THESE OLD FREE-EXPRESSION PROBLEMS GO AWAY; ON THE CONTRARY, THEY INTENSIFY THEM, AND THEY INTRODUCE A BUNCH OF NEW PROBLEMS.

Every single one of those problems is applicable to cyberspace. Computers don't make any of these old free-expression problems go away; on the contrary, they intensify them, and they introduce a bunch of new problems. Problems like software piracy. Encryption. Wire fraud. Interstate transportation of stolen digital property. Free expression on privately owned networks. So-called "data-mining" to invade personal privacy. Employers spying on employee email. Intellectual rights over electronic publications. Computer search and seizure practice. Legal liability for network crashes. Computer intrusion, and on and on and on. These are real problems. They're out there. They're out there now. And in the future they're only going to get worse. And there's going to be a bunch of new problems that nobody's even imagined yet.

I worry about these issues because guys in a position like mine ought to worry about these issues. I can't say I've ever suffered much personally because of censorship, or through my government's objections to what I have to say. On the contrary, the current US government likes me so much that it kind of makes me nervous. But I've written ten books, and I don't think I've ever written a book that could have been legally published in its entirety fifty years ago. Because my books talk about things that people just didn't talk about much fifty years ago, like sex for instance. In my books, my characters talk like normal people talk nowadays, which is to say that they cuss a lot. Even in *Hacker Crackdown* there are sections where people use obscenities in conversations, and by the way, the people I was quoting were computer cops.

I'm forty years old; I can remember when people didn't use the word "condom" in public. Nowadays, if you don't know what a condom is and how to use it, there's a pretty good chance you're gonna die. Standards change a lot. Culture changes a lot. The laws supposedly governing this behavior are very gray and riddled with contradictions and compromises. There are some people who don't want our culture to change, or they want to change it even faster in some direction they've got their own ideas about. When police get involved in cultural struggles it's always very highly politicized. The chances of its ending well are not good.

It's been quite a while since there was a really good ripping computer-intrusion scandal in the news. Nowadays the hot-button issue is porn. Kidporn and other porn. I don't have much sympathy for kidporn people; I think the exploitation of children is a vile and grotesque criminal act, but I've seen some computer porn cases lately that look pretty problematic and peculiar to me.

I don't think there's a lot to be gained by playing up the terrifying menace of porn on networks. Porn is just too treacherous an issue to be of much use to anybody. It's not a

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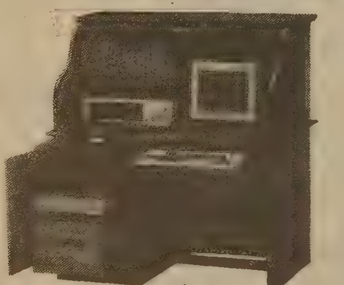

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firm and dependable place in which to take a stand on how we ought to run our networks.

For instance, there's this Amateur Action case. We've got this guy and his wife in California, and they're selling some pretty seriously vile material off their bulletin board. They get indicted in Tennessee. What is that about? Do we really think that people in Memphis can enforce their pornographic community standards on people in California? I'd be genuinely impressed if a prosecutor got a jury in California to indict and convict some pornographer in Tennessee. I'd figure that Tennessee guy had to be some kind of pretty heavy-duty pornographer. Doing that in the other direction is like shooting fish in a barrel. There's something cheap about it.

I CAN'T SAY I'VE EVER HAD ANYTHING MUCH TO DO—KNOWINGLY THAT IS—WITH WISEGUY TYPES, BUT I SPENT A LITTLE TIME IN MOSCOW RECENTLY, AND YOU KNOW, ORGANIZED CRIME AND ENDEMIC CORRUPTION ARE VERY SERIOUS PROBLEMS INDEED. YOU GET ENOUGH OF THAT EVIL CRAP GOING ON IN YOUR SOCIETY AND IT'S LIKE NOBODY CAN BREATHE.

This doesn't smell like an airtight criminal case to me. This smells to me like some guy from Tennessee trying to enforce his own local cultural standards via a long-distance phone line. That may not be the actual truth about the case, but that's what the case looks like. It's real hard to make a porn case look good at any time. If it's a weak case, then the prosecutor looks like a bluenosed goody-goody wimp. If it's a strong case, then the whole mess is so disgusting that nobody even wants to think about it or even look hard at the evidence. Porn is a no-win situation when it comes to the basic social purpose of instilling law and order on networks.

I think you could make a pretty good case in Tennessee that people in California are a bunch of flakey perverted lunatics, but I also think that in California you can make a pretty good case that people from Tennessee are a bunch of hillbilly fundamentalist wackos. You start playing off one community against another, pretty soon you're out of the realm of criminal law, and into the realm of trying to control people's cultural behavior with a nightstick. There's not a lot to be gained by this fight. You may intimidate a few pornographers here and there, but you're also likely to seriously infuriate a bunch of bystanders. It's not a fight you can win, even if you win a case, or two cases, or ten cases.

People in California are never gonna behave in a way that satisfies people in Tennessee. People in California have more money and more power and more influence than people in Tennessee. People in California invented Hollywood and Silicon Valley, and people in Tennessee invented ways to put smut labels on rock and roll albums.

This is what Pat Buchanan and Newt Gingrich are talking about when they talk about cultural war in America. And this is what politically correct people talk about when they launch eighteen harassment lawsuits because some kid on some campus computer network said something that some ultrafeminist radical found demeaning.

If I were a cop, I would be very careful of looking like a pawn in some cultural warfare by ambitious radical politicians. The country's infested with zealots now, zealots to the left and right. A lot of these people are fanatics motivated by fear and anger, and they don't care two pins about public order, or the people who maintain it and keep the peace in our society. They don't give a damn about justice, they have their own agendas. They'll seize on any chance they can get to make the other side shut up and knuckle under. They don't want a debate. They just want to crush their enemies by whatever means necessary. If they can use cops to do it, great! Cops are expendable.

There's another porn case that bugs me even more. There's this guy in Oklahoma City who had a big FidoNet bulletin board, and a storefront where he sold CD-ROMs. Some of them, a few, were porn CD-ROMs. The Oklahoma City police catch this local hacker kid and of course he squeals like they always do, and he says don't nail me, nail this other adult guy, he's a pornographer. So off the police go to raid this guy's place of business, and while they're at it they carry some minicams and they broadcast their raid on that night's Oklahoma City evening news.

This was a really high-tech and innovative thing to do, but it was also a really reckless cowboy thing to do, because it left no political fallback position. They were now utterly committed to crucifying this guy, because otherwise it was too much of a political embarrassment. They couldn't just shrug and say, "Well, we've just busted this guy for selling a few lousy CD-ROMs that anybody in the country can mail-order with impunity out of the back of a computer magazine." They had to assemble a jury, with a couple of fundamentalist ministers on it, and show the most rancid graphic image files to the twelve good people and true. And you know, sure enough it was judged in a court to be pornography. I don't think there was much doubt that it was pornography, and I don't doubt that any jury in Oklahoma City would have called it pornography by the local Oklahoma City community standards.

This guy got convicted. Lost the trial. Lost his business. Went to jail. His wife sued for divorce. He lost custody of his kids. He's a convict. His life is in ruins.

The hell of it, I don't think this guy was a pornographer by any genuine definition. He had no previous convictions. Never been in trouble, didn't have a bad character. Had an honorable war record in Vietnam. Paid his taxes. People who knew him personally spoke very highly of him. He wasn't some loony sleazebag. He was just a guy selling disks that other people just like him sell all over the country, without anyone blinking an eye. As far as I can figure it, the Oklahoma City police and an Oklahoma prosecutor skinned this guy and nailed his hide to the side of a barn, just because they didn't want to look bad. I think a serious injustice was done here.

I also think it was a terrible public relations move. There's a magazine out called *Boardwatch.* Practically everybody who runs a bulletin board system in this country reads it. When the editor of this magazine heard about the outcome of this case, he basically went nonlinear. He wrote this scorching furious editorial berating the authorities.

The Oklahoma City prosecutor sent his little message all right, and it went over the Oklahoma City evening news, and probably made him look pretty good, locally, personally. But this magazine sent a much bigger and much angrier message, which went all over the country to a perfect target computer-industry audience of BBS sysops. This editor's message was that the Oklahoma City police are a bunch of crazed no-neck gestapo, who don't know nothing about nothing, and hate anybody who does. I think that the genuine cause of computer law and order was very much harmed by this case.

It seems to me that there are a couple of useful lessons to be learned here. The first, of course, is don't sell porn in Oklahoma City. And the second lesson is, if your city's on an antiporn crusade and you're a cop, it's a good idea to drop by the local porn outlets and openly tell the merchants that porn is illegal. Tell them straight out that you know they have some porn, and they'd better knock it off. If they've got any sense, they'll take this word from the wise and stop break-

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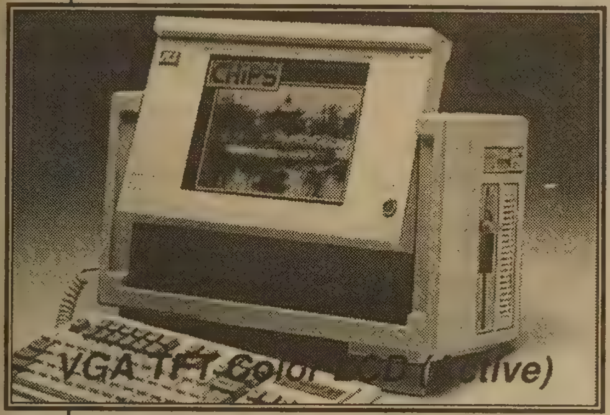

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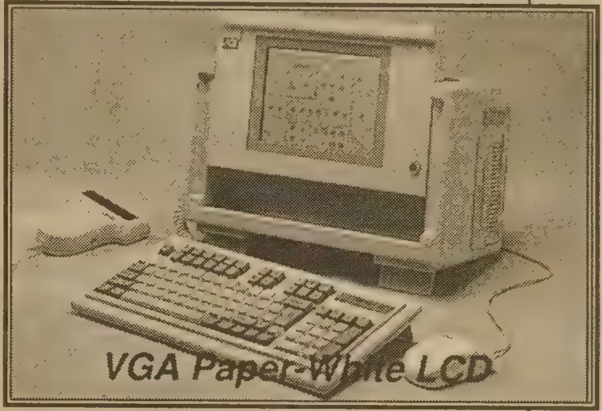

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Don't jump in headfirst with an agenda and a videocam. Because it's real easy to wade hip deep into a blaze of publicity, but it's real hard to wade back out without getting the sticky stuff all over you.

Well, it's generally a thankless lot being an American computer cop. You know this, I know this. I even regret having to bring these matters up, though I feel that I ought to, given the circumstances.

> IF I WERE A COP, I WOULD BE VERY CAREFUL OF LOOKING LIKE A PAWN IN SOME CULTURAL WARFARE BY AMBITIOUS RADICAL POLITICIANS. THE COUNTRY'S INFESTED WITH ZEALOTS NOW, ZEALOTS TO THE LEFT AND RIGHT. A LOT OF THESE PEOPLE ARE FANATICS MOTIVATED BY FEAR AND ANGER, AND THEY DON'T CARE TWO PINS ABOUT PUBLIC ORDER, OR THE PEOPLE WHO MAINTAIN IT AND KEEP THE PEACE IN OUR SOCIETY.

It Could Be Worse

I do, however, see one large ray of light in the American computer law enforcement scene, and that is the behavior of computer cops in other countries. American computer cops have had to suffer under the spotlights because they were the first people in the world doing this sort of activity. But now we're starting to see other law enforcement people weighing in in other countries. To judge by early indications, the situation's going to be a lot worse overseas.

Italy, for instance. The Italian finance police recently decided that everybody on FidoNet was a software pirate, so they went out and seized somewhere between fifty and a hundred bulletin boards. Accounts are confused, not least because most of the accounts are in Italian. Nothing much has appeared in the way of charges or convictions, and there's been a lot of anguished squawling from deeply alienated and radicalized Italian computer people.

Italy is a country where entire political parties have been annihilated because of endemic corruption and bribery scandals. A country where organized crime shoots judges and blows up churches with car bombs. They got a guy running the country now who is basically Ted Turner in Italian drag—he owns a bunch of television stations—and here his federal cops have gone out and busted a bunch of left-wing bulletin board systems. It's not doing much good for the software piracy problem and it's sure not helping the local political situation. In Italy politics are so weird that the Italian Communist Party has a national reputation as the party of honest government. The Communists hate the guts of this new Prime Minister, and he's in bed with the neo-fascist ultra-right and a bunch of local ethnic separatists who want to cut the country in half. That's a very strange and volatile scene.

The hell of it is, in the long run I think the Italians are going to turn out to be one of the better countries at handling computer crime. Wait till we start hearing from the Poles, the Romanians, the Chinese, the Serbs, the Turks, the Pakistanis, the Saudis.

Here in America we're actually getting used to this stuff, a little bit, sort of. We have a White House with its own Internet address and its own World Wide Web page. Owning and using a modem is fashionable in the USA. American law enforcement agencies are increasingly equipped with a clue. In Europe you have computers all over the place, but they are imbedded in a patchwork of PTTs and peculiar local jurisdictions and even more peculiar and archaic local laws.

I think the chances of some social toxic reaction from computing and telecommunications are much higher in Europe and Asia than in the USA. I think that in a few more years, American cops are going to earn a global reputation as being very much on top of this stuff. I think there's a fairly good chance that the various interested parties in the USA can find some kind of workable accommodation and common ground on most of the important social issues. There won't be so much blundering around, not so many unpleasant surprises, not so much panic and hysteria.

As for the computer crime scene, I think it's pretty likely that American computer crime is going to look relatively low-key, compared to the eventual rise of ex-Soviet computer crime, and Eastern European computer crime, and Southeast Asian computer crime.

I'm a science fiction writer, and I like to speculate about the future. I think American computer police are going to have a hard row to hoe, because they are almost always going to be the first in the world to catch hell from these issues. Certain bad things are naturally going to happen here first, because we're the people who are inventing almost all the possibilities.

But I also feel that it's not very likely that bad things will reach their full extremity of awfulness here. It's quite possible that American computer police will make some really awful mistakes, but I can almost guarantee that other people's police will make mistakes worse by an order of magnitude. American police may hit people with sticks, but other people's police are going to hit people with axes and cattle prods. Computers will probably help people manage better in those countries where people can actually manage. In countries that are falling apart, overcrowded countries with degraded environments and deep social problems, computers might well make things fall apart even faster.

Countries that have offshore moneylaundries are gonna have offshore data laundries. Countries that now have lousy oppressive governments and smart, determined terrorist revolutionaries are gonna have lousy oppressive governments and smart determined terrorist revolutionaries with computers. Not too long after that, they're going to have tyrannical revolutionary governments run by zealots with computers, and then we're likely to see just how close to Big Brother a government can really get. Dealing with these people is going to be a big problem for us.

Other people have worse problems than we do, and I suppose that's some comfort to us in a way. But we've got our problems here, too. It's no use hiding from them. Since 1980 the American prison population has risen by 188%. In 1993 we had 948,881 prisoners in federal or state correctional facilities. I appreciate the hard work it took to put these nearly one million people into American prisons, but you know, I can't say that the knowledge that there are a million people in prison in my country really makes me feel much safer. Quite the contrary, really. Does it make keeping public order easier when there are so many people around with no future and no stake in the status quo and nothing left to lose? I don't think it does.

We've got a governor's race in my state of Texas that's a nasty piece of work—the incumbent and the challenger are practically wrestling in public for the privilege of putting on a black hood and jabbing people with the needle. That's not a pretty sight. I hear a lot about vengeance and punishment lately, but I don't hear a lot about justice. I hear a lot about rights and lawsuits, but I don't hear a lot about debate and public goodwill and public civility. I think it's past time in this country that we stopped demonizing one another, and tried to see each other as human beings and listen seriously to each other. And personally, I think I've talked enough this morning. It's time for me to listen to you guys for a while.■

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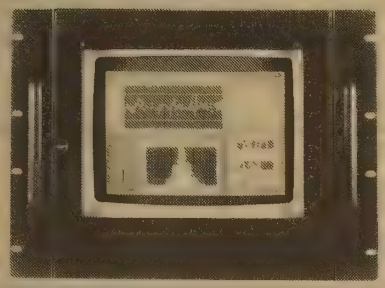

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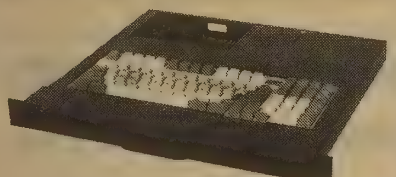

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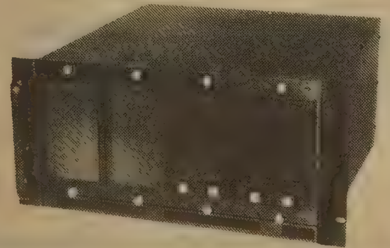

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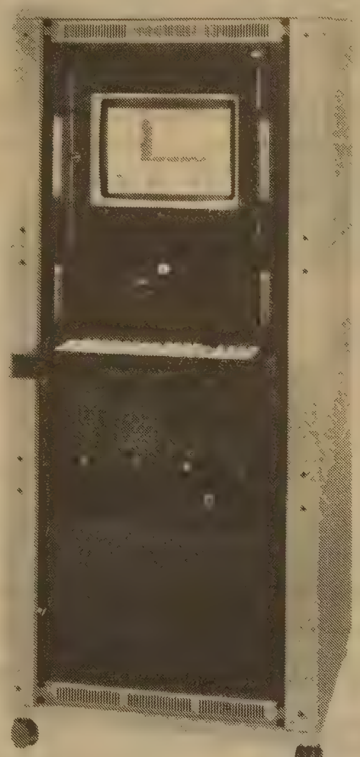

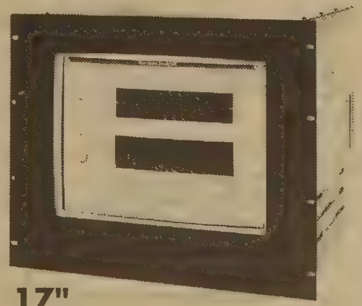

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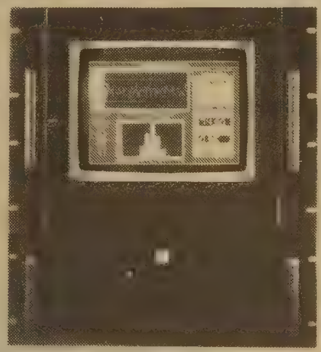

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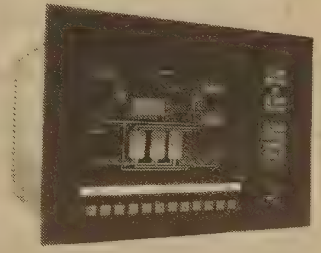

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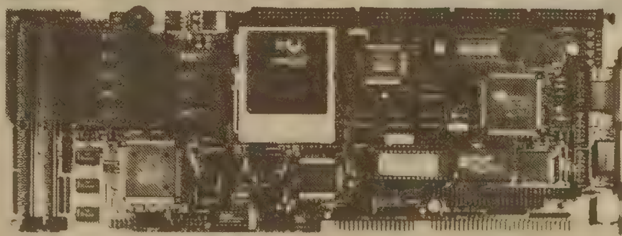

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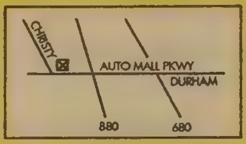

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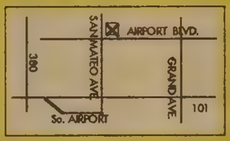

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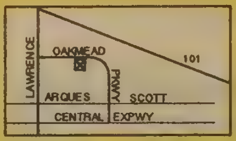

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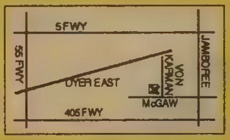

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TO GO ONLINE
Or Not To Go Online

For Newspapers, That May Be The Question. The San Francisco Newspaper Strike As Case History

By Robert Moskowitz

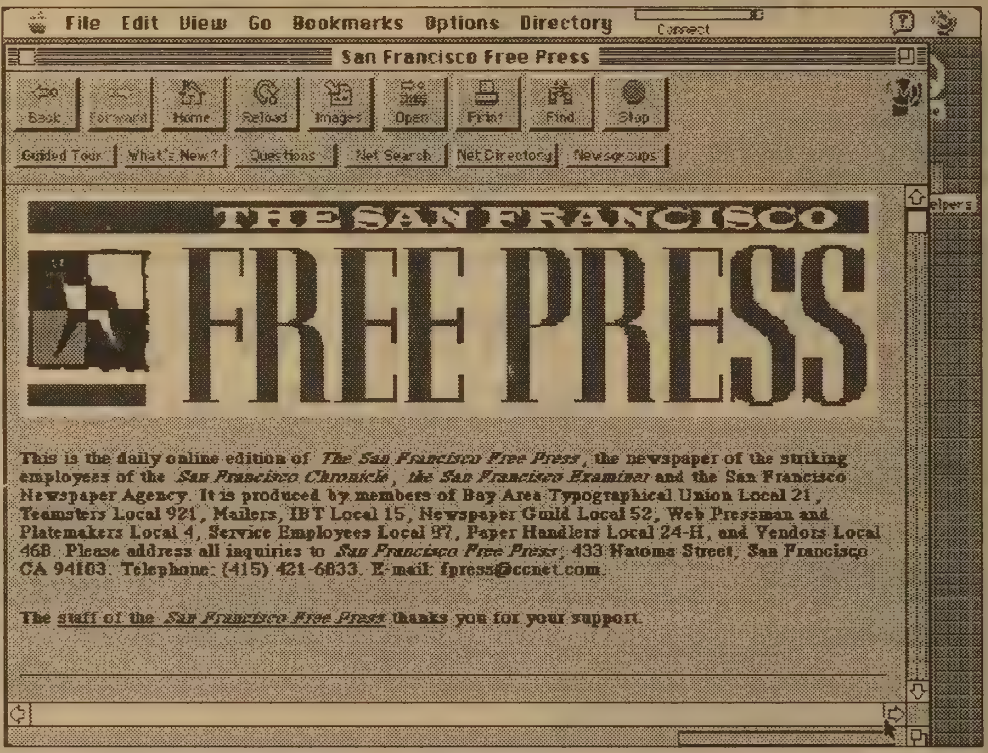
It was a dark and stormy night. Echelons of capitalists and unionists, managers and laborers, bean counters and pencil pushers were gathered in a vast and acrimonious debate, discussion, negotiation. Neither side would give any quarter, and with hindsight it now appears inevitable that the situation would end in the bitter and violent eleven-day newspaper strike that captured the imagination of San Francisco and, to some extent, the entire nation.

But the politics of the strike itself, and even informed discussion of which side, if any, emerged the victor, has little or nothing to do with the larger issue highlighted and underscored by the strike: What is the proper role of newspapers in today's undeniably technological world?

Some have argued that newspapers are a dying breed, and good riddance. Others have insisted that newspapers are temporarily slow to adapt to the new technologies and cultural dimensions of our changing world, and that in time they will regain their preeminence in news dissemination—or at least over the branch of it that includes department store and new car dealer advertising.

The fact is that modern computers and the Internet have put through an information superhighway that bypasses the old Main Street inhabited by newspapers. You no longer need to invest millions to become a purveyor of breaking news. Just be there to witness it, and have a computer with a network connection. For proof, just look at the thousands of people who presently create (in the old days, we might have said "pen") their own newsletters, newspapers, chat pages, compendiums, indices, and "how to" guidebooks covering everything from Afghanistan to Zygotes.

To get a heightened sense of old versus new newspaper technology, it's instructive to look at what happened immediately after a handful of union and management decision-makers disagreed over trucks and delivery systems, and decided that San Francisco would be a town without a daily newspaper.



This is the daily online edition of *The San Francisco Free Press*, the newspaper of the striking employees of the *San Francisco Chronicle*, *the San Francisco Examiner* and the San Francisco Newspaper Agency. It is produced by members of Bay Area Typographical Union Local 21, Teamsters Local 921, Mailers, IBT Local 15, Newspaper Guild Local 52, Web Pressman and Platemakers Local 4, Service Employees Local 87, Paper Handlers Local 24-H, and Vendors Local 468. Please address all inquiries to *San Francisco Free Press*, 433 Natoma Street, San Francisco CA 94103. Telephone: (415) 421-6833. E-mail: fpress@ccnet.com.

The staff of the *San Francisco Free Press* thanks you for your support.

The San Francisco Free Press

The unions struck on Tuesday and by Thursday the *San Francisco Free Press* was available over the Internet. Most of the big-name columnists from both the *Chronicle* and the *Examiner* offered their stories to the *Free Press*, which instantly made it a far more exciting read than any other daily newspaper in that town.

The all-electronic *Free Press* was designed by Marcelo Rodriguez and Bruce Koon, who was already working at the electronic newspaper called *The Gate*. This was and still is an offering of the San Francisco Newspaper Agency, an organization created to provide delivery and other services for the *Chronicle* and the *Examiner*. Rodriguez and Koon brought in a graphics designer to do the banner, masthead, icons, and other details, and provided the *Free Press* with an overall simple, elegant format.

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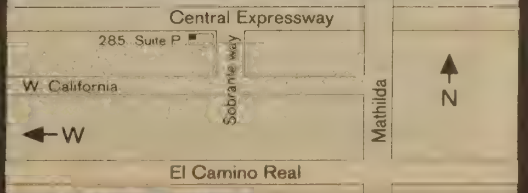

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To Go Online... *continued...*

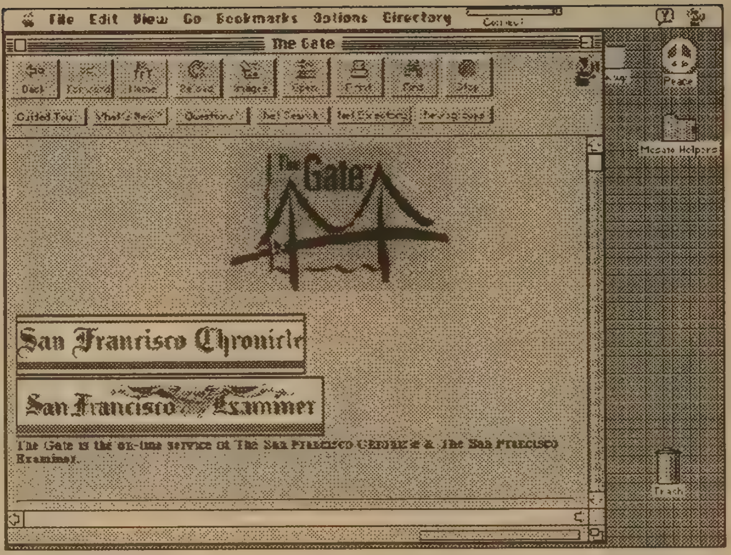
It was an instant success. During the *Free Press*'s first couple of days on the Internet, seventy-one thousand people took at look at it. People heard about the *Free Press* (quickly dubbed "the Freep" by its staff and interested readers) in large numbers as word spread on the Internet and also on Sausalito's online WELL, which had three or four discussions about it almost from the moment of the Freep's inception. While gratifying to the strikers, this level of popularity only intensified the pressures on Freep staffers, who were doing all the coding by hand and struggling to make deadlines with stories from writers who were turning in their copy very late.

Fortuitously, Dave Winer, one of the many people with his own newsletter on the Internet, happened to hear that union organizers were setting up a "strike" paper, and that they were expected to have distribution problems. He offered to help. He discovered the union already had a site on the Internet's World Wide Web (the graphics-oriented portion of the world's largest computer network), but needed logistical help in keeping up with the demand for conversion of text to hypertext and World Wide Web-style graphics.

Winer saw this as an opportunity to test his skills and learn a little more about networking. "I learned a tremendous amount," he recalls, fondly, "and ended up with some great automated scripts for converting text to Web pages." Later, he would play a major role in making the *Free Press* available via email, which he claims is even better than Web pages because more people can receive it.

Winer hooked up with Cynsa Bonorris, special projects coordinator at The WELL, in Sausalito, CA, and the pair worked ten hours nonstop to create an automated system for converting text-based stories into hypertext Web pages. The process involves creating index pages and converting story titles into "buttons" that, when clicked with a mouse, switch the viewer to the appropriate graphics and/or text information.

The Mac-based script, written in Frontier, automatically takes a folder with text-based articles and marks them up in hypertext markup language (html) so they are suitable for display on the Web. The final product is an index or title page with buttons for each of the newspaper's departments, with each department's index page containing buttons to take readers to the individual articles, and so on. Each story's file is individually marked up in html so that its title, subtitle, byline, and other introductory lines are displayed in specified fonts, sizes, and styles, and so the story displays with its associated graphic images in the right places.



The Gate is the on-line service of The San Francisco Chronicle & The San Francisco Examiner.

The WELL's Cynsa Bonorris: "We were highlighting the jewels of the papers. We had an excellent product compared with The Gate. All we needed were the writers and editors. We didn't need to print or distribute it."

Over the next few days, Bonorris made improvements to the basic scripts—for example, finding ways to include additional buttons at the bottom of index pages.

These automated scripts greatly reduced the demands for difficult, time-consuming coding by hand on the part of the *SF Free Press*' staff, and turned a difficult task requiring extraordinary human efforts into a fairly simple, quick process.

The Chronicle

Conrad Gordon, systems engineer of *The Gate*, recalls that the day before the newspaper strike, he was involved in an "academic" discussion about whether it would be possible to put the *Chronicle* and the *Examiner* on the Internet. "Then the strike happened," he says, "and the next day we did it!"

Basically, Gordon's group received a raw feed of online text information from SII (the software used for publishing the *Chronicle* on paper). Working with Eric Hollander and Allen Weiner in the offices of the San Francisco Newspaper Agency, Gordon wrote new scripts to transform this raw feed into the finished Web pages that were made available daily, and can still be seen on the network.

The original Web page took about eight hours to program and put on the Net. "With that accomplished," Gordon reports, "it requires only about two to three hours per day to keep things updated."

The *Chronicle* had certain advantages over the *Free Press* group: it began with an existing Web page for *The Gate*, which had originated on Gordon's white board early in 1994, and which became available on the Net by early summer. The original plan was not to include all the daily newspapers' content, but instead to carry selected material from each and to enhance this with special contents.

When the strike started, however, Gordon immediately set about hooking "partials" of both newspapers to the existing *Gate* home page on the Web. At first, Gordon's team managed to provide only about 70% of the paper's content. Later, they automated more of the work and got closer to 80% of what was printed in the paper. The effort continues, and Gordon pledges the online version of the *Chronicle* and *Examiner* will soon contain 100% of the printed material. "We're having a few technical problems with pictures," he confesses, "but we'll solve them."

The basic process is straightforward, and similar to that used by the *Free Press*. Each paper's editor puts content slated for the electronic version of the newspaper into a special folder. The scripts retrieve that data and put each story where it belongs within the pre-established structure of the online publication. The title, or slug, of the story becomes a button on a higher-level menu or index page that takes a reader to the story.

During the first days of the strike, more than ninety thousand people per day were looking at the online *Chronicle*, including viewers Gordon has tracked from as far away as Moscow and Taiwan. Today, "readership" has leveled off at sixty-five to seventy-five thousand per day.

Because management views the online publications as adjuncts to the printed newspapers, rather than replacements, the *Chronicle* hasn't yet increased advertising rates. "Eventually advertisers may pay a little more," Gordon opines, "but not much."

The Examiner

Chris Gulker, director of development for the *San Francisco Examiner*, was primarily responsible for getting his paper onto the Internet. But his group has gone quite a bit further than either of the other groups.

He recalls that Will Hearst, the publisher, came back from a meeting at Sun Microsystems, where John Gage had buttonholed him to talk about putting Web-server software on a Sun workstation with a network connection at the *Examiner*. Gulker spent a morning at Sun learning how to code html, and afterwards "played" with a home page on his own evenings and weekends. "It caught on," he says, "attracting four thousand viewers, or readers, a day."

Soon *The Gate* and the *Chronicle* put up their own home pages, and Hearst

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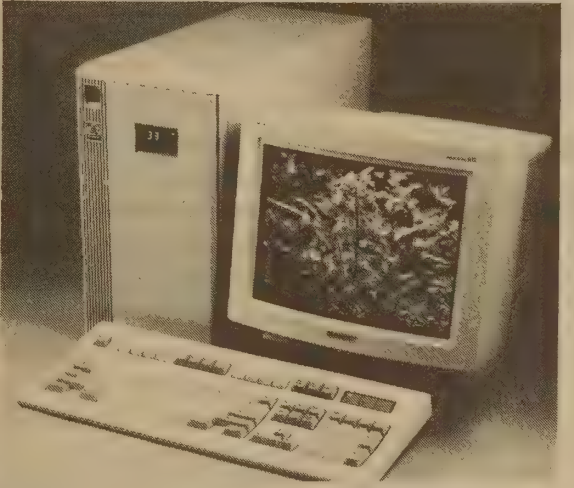

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To Go Online... *continued...*

told him to do more.

In August, Gulker made an arrangement with another Hearst paper, the *Albany Times/Union*, which had sent eleven staff people to the Woodstock II concert/festival. Gulker put their photos, stories, and even some unusual watercolor paintings on the *Examiner*'s Web page, and interest ballooned to about fifty thousand "hits" in three days. Afterwards, the home pages were getting about eight to ten thousand hits per day. "It seems," says Gulker, "that network links get put in place for a special reason, like the Woodstock festival paintings, but then they stay in place long afterwards."

Gulker's next experiment was to install a video camera at the newspaper's booth at the Seybold Publishing Conference, and put a button on the home page, labeled: "Push this to see who's at our booth." That earned another fifty to sixty thousand hits in three days, and when the wave of interest receded, the base level was up to about twenty thousand viewers per day.

At this point, Will Hearst put Gulker on the Web activity full time. "Let me know when we get to one hundred thousand hits per day," he told Gulker, enthusiastically. "I think we can create a business."

Gulker began to train a couple of people, including Bruce Koon, who would later get together with others to put up the *San Francisco Free Press* electronic newspaper during the November strike. The *Examiner* continued to write and publish during the strike, and the notion of "two sides in a bitter conflict, each with their Web server," proved very popular on the Net. On November 8, Gulker moved the *Examiner*'s Web site to a more powerful computer with a bigger connection to the Internet. That day, the paper published a story online containing election results. It attracted 155,000 hits in one day, much increased from the previous day's total of thirty-eight thousand. "That was reportedly the busiest site on the Net that day," says Gulker, with a modest amount of pride.

Today, average daily "readership" is stable at fifty to sixty-five thousand hits per day, and Will Hearst has decided this can become a business. Gulker is currently retrofitting the *Examiner*'s archives and daily operations to support online publishing as a serious business operation.

As Gulker explains it, "The model I've offered to Will is a bit like cable TV, with multiple revenue streams."

The *Electric Examiner* is presently running eleven experiments, from traditional display ads to more highly interactive ideas, and Gulker has more experiments planned for 1995.

The Gate's Conrad Gordon admits to certain differences between publishing on paper and online. "You have more than just one paper or two papers," he says. "Internet users have the whole world at their fingertips."

Here are a few of the possibilities that help highlight differences between paper-based and electronic publishing:

•Suppose you read a review of *The Phantom of the Opera*, or some other performance piece. With the *Electric Examiner*, you can click on a button and see a map of the theater with available seats highlighted in color. Click on the seats you want and an order form comes up. You pay online, and pick up your tickets at the theater's "will-call" window.

•Suppose you browse the paper's Woodstock page. At the bottom is a link to Apple, which gives you a further list of options to read about products and get technical support. Later, Apple, Ford, and other vendors may gladly pay the *Examiner* a small fee for everyone who clicks into their Web pages from the *Examiner*'s pages.

The *Examiner* is also experimenting with offering a full text search of its archives (since 1988). A search using plain English words can yield a list of articles ranked by their relevance. Click on a headline and you can read the story, with your search words already highlighted. The bottom of story can contain links to other related stories, and also a special button saying "Find more stories like this one."

Gulker says the *Examiner* is going to give this service away initially, but at some point may feel justified in having a fee or monthly charge in hopes of converting some part of the user base into paying customers.

Farther down the line, Gulker says the *Examiner* may allow people to have their own home page, either independently or as part of the *Examiner*'s pages. He also hopes to repackage these information services and sell the product to other companies, who might subscribe on behalf of all their employees to an online service that provides stories of interest, the company's current stock price, and other resources all in one place, quick and easy to use.

Implications

The most obvious lesson from all this is how cheap and simple it is to reach large numbers of people over computer networks. If a newspaper publisher has millions invested in plant and equipment, the publishing process starts from and builds upon a certain mindset heavily involved with major advertisers, and requiring large-scale income and expense figures. For newspapers to be printed and distributed every day, there are additional pressures associated with the need to operate a fleet of trucks, compress stories to fit available space, and so forth.

If, however, a newspaper publisher starts with an investment smaller than 1% of that of a print-bound colleague (or competitor), the mindset and operating requirements can be very different.

"We felt we were working for the cause of the unions," says Bonorris. "We were highlighting the jewels of the papers. We had an excellent product compared with *The Gate*. All we needed were the writers and editors. We didn't need to print or distribute it. A lot of people emailed us saying we should continue producing the *Free Press*, that this is the way newspapers are heading." But of course, when the strike ended the writers immediately went back to their jobs at the *Chronicle* and *Examiner*, and the *Free Press* was frozen in mid-evolution.

Asked about the future, Gordon is blunt: "This is the future," he insists. "We just happen to be here before everyone else. It's just like when TV started. Online may be no better than paper, just a different way of getting at the information. Maybe in a hundred years it might replace the paper. But not now."

Yet Gordon admits to certain differences between publishing on paper and online. "You have more than just one paper or two papers," he says. "Internet users have the whole world at their fingertips."

From the writers' point of view, there is also an impact on the content that is ultimately published. One reporter told Gordon that now he can make his stories much larger than before. He's not limited to the space allotted him in the printed newspaper.

Making A Good Online Newspaper

From all this experience with online newspapers, piled on top of countless reader-years of online publishing in newspaper and other formats, certain conventions and imperatives have emerged for creating better online and Web documents.

First, it's important to cut down on extraneous and unnecessary graphic images to minimize the users' downloading time. If each page takes a few minutes to appear on your screen, you'll quickly lose interest and train of thought.

Second, it's useful to store the information on a fast, efficient server with a relatively large connection to the Internet (a T-1 is generally considered large enough). Otherwise, too many hopeful readers are blocked from ever connecting, or "timed out" when the server is too slow to respond

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To Go Online... *continued...*

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RESOURCES:

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90MHz $2267

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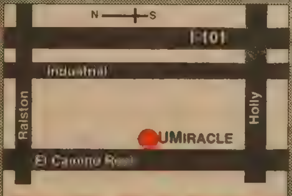

From north, Off I-101 Ralston Ave towards west, left on El Camino Real and make a U-turn. From south exit Holly St, right on El Camino Real, 3 minute down the block..

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Phone: 510-226-6746
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Business Hour
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Sunday 10:00AM-6:00PM
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Christy St
880N
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UMIRACLE
Auto Mall Pkwy (Old Durham)

Off I-880 Auto Mall Pkwy West (or off 680 Durham, go west and pass the I-880 overpass), right on second light, we are inside Lincoln Executive Center, the first business park on your right

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019	MAYO CLINIC FAMILY HEALTH BK	$15
020	NATIONAL GEOGRAPHIC MAMMALS	$17
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036	ANIMALS ENCYCLOPEDIA MPC	$18
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054	CHESS MANIA	$39
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101	MIRROR MIRROR	$15
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117	PLAYING W/ LANG/FRENCH	$15
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125	SAN DIEGO ZOO/ANIMALS	$12
126	SECRET WEAPON OF LUFTWAFFE	$14
127	THE SEVENTH GUEST - VIRGIN	$19
131	SHAREWARE GOLD VOL 2.0	$43
138	SIMTEL MSDOS SHAREWARE	$15
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229	DR. GAMES FOR WINDOWS	$9
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No.	Description	Price
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243	HACKER CHRONICIES	$25
244	HAM RADIO QRZI	$15
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248	MAD DOG McCREE	$26
250	MONEY,MONEY,MONEY	$18
252	OCEAN BELOW	$15
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259	PUBLISHER'S PARADISE	$24
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267	SUPER GAMES FOR DOS	$9
268	SUPER GAMES FOR WINDOWS	$9
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273	SUPER WINDOWS SHAREWARE II	$18
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323	MAGIC DEATH	$16
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328	NAUTILUS MULTIMEDIA MAGAZINE	$25
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339	HIDDEN OBSESSIONS****	$35
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375	IMAGE WORLD I	$12
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465	DOOM MANIA	$16
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468	SWIM SUIT VOL.1****	$22
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486	COLLECTIBLE****	$26
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Albany CA 94706
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Fax: 510-526-0273

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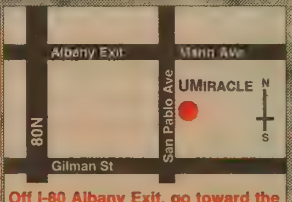
Sunday 10:30AM-6:00PM
Yes! Open on Sunday!



Off I-80 Albany Exit, go toward the hill and turn right on San Pablo Avenue, We are facing U.C.Village. Or off I-80 Gilman St, go toward the hill and make left turn on San Pablo Avenue.

Ph:415-592-3333

BELMONT BRANCH STORE:
1501 El Camino Real #E
Belmont CA 94002
Phone: 415-592-3333
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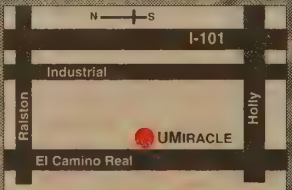

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Auto Mall Pkwy (Old "Durham")

Off I-880 Auto Mall Pkwy West, (or if off 680 Durham, go west and pass the I-880 overpass), right on second light, we are inside Lincoln Executive Center, the first business park on your right.

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486 AIR-SH ISA VLB 256K - 3 VLB slots, Upto 128MB by 72Pin, ZIF, P5 OD support, Bus-master, 3.3V CPU Suppt, AMI, SIS Chipset, U.S. Quality	$115
486 AIR-MI ISA VLB 256K - 3 VLB slots, Upto 128MB by 72Pin, ZIF, P5 OD support, Bus-master, VLB IDE, FD, 16550 UART's, 2S/P/G, Power Saving Mgmt, U.S.Quality	$165
486 AIR-MIS ISA VLB 256K - 2 VLB slots, Upto 64MB by 72Pin, ZIF, P5 OD Support, Bus-master, VLB IDE, FD, 2S/1P & VLB SCSI-2 w/ Adaptec 6360 chipset, and EZ-SCSI software driver,U.S.Quality	$205
486 ISA PCI - 3 PCI, 5 ISA Slots, ZIF, P5 OD Support, Intel Saturn ChipSet, Upto 128MB by 72Pin SIMM, Bus-master, Dallas onboard Battery, Phoenix BIOS, onbrd PCI NCR SCSI-2 Controller, Complete drivers for OS/2, NT,UNIX, 256K/512K	$220/300
486 AIR-VP ISA PCI/VLB - 4 PCI, 4 ISA/2 VLB Slots, Cache upto 1MB, 30 & 72Pin SIMM upto 128MB, P5 OD Support, Bus-master, EPA Green PC, support 3.3V 100DX/4, Award BIOS, 256K/512K	$165/245
P5 Pentium PCI 60/66MHz- 4 PCI, 4 ISA Slots, ZIF, Intel Mercury ChipSet, Upto 128MB by 72Pin SIMM, Bus-master, Dallas onboard Battery, Phoenix BIOS, onbrd PCI NCR SCSI-2 Controller, Complete drivers for OS/2, NT,UNIX, 256K/512K	$320/400
Intel Premiere PCI II Plato 90MHz 256K, suppt 72Pin SIMM, bulit-in PCI-IDE, FD, 2 hi-spd 16550 Serials, enhanced Parallel, support Enhanced IDE LBA Mode-3 Standrd, support 4 IDE HDs. Flash AMI BIOS, Green Power Saving, Neptune Chipset	$315
SuperMicro P54VL-PCI 512K - 90/100MHz P5 suppt, ZIF, 4 PCI/2 VLB/5-16Bit ISA slots, Bus-master, Upto 128MB by 72Pin, Green PowerSaving, U.S. Made	$325
AIR P5 Pentium EISA PCI 512K - 90/100MHz P5 Suppt, ZIF, 3 PCI/4 EISA slots, Bus-master, Upto 128MB by 72Pin, AMI BIOS, 32-bit PCI bus-mastering SCSI ports using Adaptec AIC 7870 controller (equvialent to AHA-2940W) supporting 50Pin Fast SCSI-2 & 68Pin Fast WIDE SCSI-2, onbrd floppy ports supporting 2.88MB, High speed 16550 UART com1 and com2 ports, bi-directional enhanced Parallel port, SCSI cables and complete OS software driver included	$675
P5 Dual Pentium EISA PCI 512K - 90/100MHz P5 Suppt. ZIF's, 4 PCI/4 EISA slots, Bus-master, Upto 192MB by 72Pin, Award BIOS, Intel MultiProcessor Specification, Intel Neptune 82430N PCIset Chpst, Bus-Master, Windows NT 3.1/3.5 Dual processor Suppt, Complete software driver included	$880

CPU & Memory: (Prices Subject to Change Daily)

Pentium P5-90/100MHz 3.3V CPU	$Call
Pentium P5-90 Slave CPU for Dual Pentium	$Call
Pentium P5-60/66MHz CPU	$Call
Intel 486-33SX/33DX/50DX2/50DX/66DX2/100DX4	$Call
AMD 486-40DX/50DX2/66DX2/80DX2	$Call
Voltage Regulator 3.3V for 100DX/4	$30
8Kx8/32Kx8/64KX8/128Kx8 SRAM	$2/$5/$14/$32
1MB Video DRAM (44256-70ns DRAMx8pcs)	$40
1MB Video DRAM (256Kx16-70ns DRAMx2pcs)	$50
1MB Video VRAM (256Kx8-70ns VRAMx4pcs)	$80
4MB RAM SIMMs (1M-70ns SIMMx4pcs)	$Call
16MB RAM SIMMs (4M-70ns SIMMx4pcs)	$Call
72Pin 70ns RAM SIMM (4/8/16/32/64MB)	$Call

I/O Card/Controller Card/Network Card

Single Parallel Printer Card	$10
8 Bit AT I/O 2S/1P/1G	$12
8 Bit AT I/O 2S/1P/1G w/ 2 HiSpd UART 16550's	$30
16 Bit IDE/4FD 2.88MB support	$25
16 Bit IDE/2FD with 2S/1P/1G	$13
16 Bit IDE/4FD with 2S/1P/1G 2.88MB support, HiSpd 16550 UART's on Serial ports	$35
VLB 32 Bit IDE/2FD Controller with 2S/1P/1G	$18
VLB 32 Bit IDE/2FD Controller Support 2.88MB, with 2 HiSpd UART 16550's, 1 Parallel	$37
PCI IDE Controller, support 2 IDE HD's	$35
Adaptec 1522/1522K SCSI FD	$80/135
Adaptec 1542C Bus-master SCSI FD Bare	$160
Adaptec 1542CK Bus-master SCSI FD w/ Kit	$230
Adaptec 2742T RISC-based EISA SCSI-2 w/ Dual Channel supporting 14 HDs, 2.88M	$285
Adaptec 2742T RISC-based EISA SCSI-2 with Kit w/ Dual Channel supporting 14 HDs, 2.88M	$295
Adaptec 2842VL VLB-to-Fast SCSI-2 Controller w/ 2.88MB Support & Driver Kit	$235
Adaptec 2940 PCI Fast PCI SCSI-2 Bare for Systm.	$185
Adaptec 2940 PCI Fast PCI SCSI-2 Kit	$265
Adaptec 2940W PCI Fast WIDE SCSI-II, 20MB/s burst, 15 SCSI devices support,dual channel Bare for System without cable	$245
Adaptec 2940W PCI Fast WIDE SCSI-II, 20MB/s burst, 15 SCSI devices support,dual channel with 50 & 68Pin Controller Kit	$325
NCR 53C825 PCI Fast WIDE SCSI-2 68Pin & Fast SCSI-2 50Pin, Support 15 devices, 10MB/S Async, 20MB/S Sync, Complete NCR SDMS software driver	$135
AIR QAccess Fast SCSI-2 VLB Controller w/ Adaptec 6360 Chipset and EZ-SCSI Software w/ VLB IDE/FD and 2S/1P/1G	$120
External SCSI-2 50Pin Micro-D Adapter for QAccess/ MIS/Any onboard internal 50pin SCSI interfce.	$25
Ethernet NE2000 Adapter Coaxial/10-Base T	$40
3COM Etherlink III - 3C509 16bit 10-baseT/Coax	$105
3COM Etherlink III - 3C509 16bit Combo	$110
3COM Etherlink III - 3C579 EISA 32bit 10-baseT/Coaxial	$225

Video Card

16Bit 512K/1MB Trident SVGA 1024x768NI	$38/55
16Bit 1MB Tseng-4000 72Hz 32K Color	$68
S3-805 VLB Windows Accelerator 1280x1024, 16.7Million Color	$70/120
Orchid Kevin 64 Cirrus Logic CL-GD5434 VLB or PCI version 1MB/2MB DRAM	$125/175
Tseng ET-4000W32I PCI/VLB 2MB DRAM	$125
Diamond Stealth 64 PCI/VLB 64Bit Graphic Engine S3-864 1MB/2MB DRAM	$130/180
Diamond Stealth 64 PCI/VLB 64Bit Graphic Engine S3-964 2MB/4MB VRAM	$265/425
Diamond Viper PCI 2MB VRAM Weitek Power 9000 Chipset	$220
Diamond Viper SE 64Bit Graphic Engine Weitek 9100 chipset 2MB/4MB VRAM	$260/420
Diamond Viper Pro 64Bit Graphic Engine Weitek 9100+9130 chpst 2MB/4MB VRAM	$390/550
ATI Graphic Turbo Pro PCI OEM 2/4MB VRAM	$290/490
Matrox/Number Nine/Hercules Video Card	$Call

Monitor

14" ExView1Kx768NIx0.28DP Digital Ctrl Green	$215
15" ExView1280x1KNIx0.28DP Digital Ctrl Green	$330
Hitachi SuperScan 15S, 15" NI, 1280x1024, 0.28DP, FlatScreen, EPA Green, Digital Controlled	$415
Hitachi SuperScan Elite 17, 17" NI, 1600x1280, 0.26DP, FlatScreen, EPA Green, Digital Controlled	$970
MAG MX15FG 15" Digital Control LED, 30-68KHz, 1280x1024NI, upto 76Hz, .28DP, Green, MPRII, VESA DPMS	$445
MAG DX17FG 17" Digital Control 30-64KHz, 1280x1024NI, upto 76Hz, .26DP, Green, MPRII, VESA DPMS	$665
MAG MX17FG 17" Digital Control 1280x1024NI, upto 76Hz, .26DP, Green, MPRII, VESA DPMS	$795
Sony CPD-15SF 15" Trinitron 0.25DP 1280x1024, Green Support, 3 Year Manufacturer Warranty	$415
Viewsonic 15EX 15" 76Hz Green .28DP MPR-II Digital Control, Flat Screen	$355
Viewsonic 17G 17" Green W/on-Screen Cntrl	$755
Viewsonic 17 17" 0.28DP 1280x1024NI Digi.Cntl.	$875
Viewsonic 20 20" 0.28DP 1600x1280NI Digi.Cntl.	$1425
Viewsonic 21 21" 0.26DP 1600x1280NI Digi.Cntl.	$1645
NEC XE15 15" 0.28DP 1024x768NI 76Hz	**$529**
NEC XE17 17" 0.28DP 1024x768NI 76Hz	**$949**
NEC XE21 21" 0.28DP 1280x1024NI	**$1995**
NEC XP15 15" 0.28DP 1024x768NI OptiClear	**$679**
NEC XP17 17" 0.28DP 1280x1024NI OptiClear	**$1249**
NEC XP21 21" 0.28DP 1600x1200NI OptiClear	**$2499**
Nanao, Nokia, KFC Monitor	$Call

Modem

14.4K Fax/Data Internal Modem 16550 UART	$65
Digicom Connection 14.4+Fax V.32Bis Internal	$65
US Robotics Sportster 14.4K Data/Fax 16550UART V32.bis, V.32, V.42 Internal/External	$97/117
US Robotics Sportster 28.8K Data/Fax, 16550UART, Internal	**$219**

Floppy Drive/Tape Backup

Teac 1.2M 5.25"/1.44M 3.5"/2.88M 3.5"	$44/35/84
Teac Dual 1.44M & 1.2M Combo	$100
Colorado 250MB TapeBackup Internal	$155
3M Tape Cartridge DC2120 for 250MB QIC-80	$15

KeyBoard/Mice/Software/Chassis/PS/Misc

MicroSoft Natural Keyboard	$95
Chicony 101 Enhanced Keyboard	$15
KeyTronic 101 Enhanced U.S. Made	$25
Focus 2001 101 Enhanced Click w/Cover	$32
Focus 8000 111 with Calculator	$40
Focus 9000 129 Programmable w/Calculator	$55
NorthGate OmniKey 101	$74
MS Compatible 3-Button Mouse	$8
MicroSoft Ergonomic Serial Mouse V2.0	$25
Logitech Mouseman Serial	$45
Logitech Trackman Serial	$75
MS DOS 6.22/Windows V3.11/WFWG V3.11	$45/45/65
Premium Case w/230W Mini/Desktop/Med	$55/60/80
Premium Case w/250W Full Size Tower	$100
Power Supply PS-II Type 230W	$32
486 CPU Cooling Fan with heat sink	$8
P5 60/66MHz CPU Cooling Fan w/heat sink	$13
P5 90/100MHz CPU Cooling Fan w/heat sink	$16
Chassis Second Cooling Fan 3" or 3.5"	$15
Motherboard Crystal for 25/33/40/50/66/80MHz	$5
Printer Cable 10"/15"/25"	$7/9/16
FAST WIDE SCSI-2 internal Ribbon Cable, hi-density, 68Pin, 2 connectors / 3 connectors	$50/70
SCSI Cable Centronic to Micro-D 50Pin 3"	$39
SCSI Cable Centronic to Micro-D 68Pin 3"	$69
SCSI Cable Micro-D 68Pin to Micro-D 68Pin 6"	$99

CD-ROM Drive

CD-ROM Controller w/Software for Panasonic, Mitsumi, Sony	$25
Panasonic CR-562 320ms - need no caddy	$125
Toshiba XM-4101B SCSI-II 256K Cache 250ms 300KB/Sec, MultiSpin/Spd Int, Caddyless	**$169**
Toshiba XM-3401B SCSI 256K Cache 200ms, 330KB/Sec, MultiSpin/Spd Internal	$245
Toshiba XM-3501 QuadSpd SCSI-2 256K Cache 120ms, 600KB/Sec Sustained, MutlSpin/Spd Internal	[illegible]
NEC Triple Spd MultiSpin 3Xi Internal CDR-510	[illegible]
NEC Quad Speed 4Xi 600Kb/sec, 220ms, 256K Cache, Internal	**$375**
Plextor 4-Plex QuadSpeed PX-43CH 600Kb/sec, 220ms, 1MB Buffer, 2-yr warranty	$425
CD-ROM Caddy	$5

Sound Card/Speaker

Media 690 Hi-Fi Amplified Stereo Speakers	$40
80W TopTek Amplified Stereo Speaker	$55
150W Amplified MultiMedia PS-290 Speakers	$95
Media Vision ProAudio Studio 16 w/ SCSI Intrfce.	$125
Sound Blaster 16 Value Edition	$98
Sound Blaster 16 SCSI	$149
Sound Blaster 16 SCSI with ASP	$189
Sound Blaster 16 MultiCD	$129
Sound Blaster 16 MultiCD with ASP	$159
Sound Blaster 32 AWE	$265
Audio Cable - CD-ROM to Sound Card	$5

MultiMedia Package

Discovery CD 16 Upgrade Kit	[illegible]
Edutainment CD 16 Upgrade Kit	[illegible]
Game Blaster CD 16	$365

HardDisk

Western Digital

420MB IDE WDAC2420 - Enhanced IDE ATAPI	$199
540MB IDE WDAC2540 - Enhanced IDE ATAPI	[illegible]
730MB IDE WD2700A - Enhanced IDE ATAPI	[illegible]
1080MB IDE WD31000A - Enhanced IDE ATAPI	[illegible]

Quantum

540MB IDE QM30540MVA 12ms	$235
730MB IDE QM30730LTA 12ms	$385
540MB SCSI-2 QM30540MVS 12ms	[illegible]
730MB SCSI-2 QM30730LTS 12ms	$395
1.08GB Fast SCSI-3 Empire Series 1080S 512K 3.5"	[illegible]
1.4GB Fast SCSI-3 Empire Series 1400S 512K 3.5"	[illegible]
2.1GB Fast SCSI-3 Empire Series 2100S 512K 3.5"	$985

Seagate

2.1GB ST12550N Fast SCSI-2, 8.5ms, 3.5"	$1175
4.3GB ST15230N Fast SCSI-2, 8ms, 3.5"	[illegible]
9.0GB ST410800N Fast SCSI-2, 11.5ms, 5.25"	[illegible]

FAST WIDE SCSI-2 HARD DISK (68Pin Connection)

Fujitsu M2694EQA 1.08GB Fast Wide SCSI-2	[illegible]
Micropolis MC2217DW 1.75GB Fast Wide SCSI-2	$1285
Seagate ST12550W 2.1GB Fast Wide SCSI-2	$1495
Seagate ST43401W 2.9GB Fast Wide SCSI-2	$2125

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**Bolded items indicate new items we have added

**Red prices indicate newly lowered prices

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PENTIUM -90/256C VLB PCI USA	$268	$838	N/A	$1,138	$1,308	$1,318	$1,488	$1,548	$1,718
PENTIUM -66/256C VLB PCI USA	258	688	N/A	988	1,158	1,168	1,338	1,398	1,568
PENTIUM -60/256C VLB PCI USA	258	638	N/A	938	1,108	1,118	1,288	1,348	1,518
INTEL PENTIUM -90/256C PCI	298	858	N/A	1,158	1,328	1,338	1,508	1,568	1,738
INTEL PENTIUM -60/256C PCI	228	588	N/A	888	1,058	1,068	1,238	1,298	1,468
PENTIUM -90/256C VLB PCI	218	778	N/A	1,078	1,248	1,258	1,428	1,488	1,658
PENTIUM -90/256C PCI	208	768	N/A	1,068	1,238	1,248	1,418	1,478	1,648
PENTIUM -66/256C VLB PCI	188	588	N/A	888	1,058	1,068	1,238	1,298	1,468
PENTIUM -60/256C VLB PCI	188	548	N/A	848	1,018	1,028	1,198	1,258	1,428
IBM 486BL-75/256C VLB	N/A	198	$348	468	618	648	798	878	1,028
IBM 486SLC2-66/64C VLB	N/A	138	288	398	548	578	728	808	958
486DX2-66/128C VLB PCI	88	238	378	498	648	678	828	908	1,058
486DX2-50/128C VLB PCI	88	198	338	468	618	648	798	878	1,028
486DX-40/128C VLB PCI	88	194	334	458	608	638	788	868	1,018
486DX-33/128C VLB PCI	88	190	330	454	604	634	784	864	1,014
486DX2-80/256C VLB	88	278	418	538	688	718	868	948	1,098
486DX2-66C VLB	68	208	348	468	618	648	798	878	1,028
486DX-50C VLB	68	218	358	478	628	658	808	888	1,038
486DX2-50C VLB	68	168	304	438	588	618	768	848	998
486DX-40C VLB	68	164	300	428	578	608	758	838	988
486DX-33C VLB	68	162	298	424	574	604	754	834	984
486SX-25C VLB	68	122	264	384	534	564	714	794	944
486DLC-40/128C VLB	84	128	268	388	538	568	718	798	948
486DX2-66C ISA	58	198	344	464	614	644	794	874	1,024
486DX2-50C ISA	58	154	298	418	568	598	748	828	978
486SX-25C ISA	58	118	258	378	528	558	708	788	938
486SLC-33 ISA	N/A	78	228	348	498	528	678	758	908
386DX-40/128C	N/A	82	220	358	508	538	688	768	918
386SX-40	N/A	56	208	328	478	508	658	738	888

• **BASIC SYSTEM:** Motherboard & CPU, 1MB RAM, IDE with I/O, 1.44MB FDD, Case with Power Supply, and 101-Key Keyboard.

BEST MULTIMEDIA SYSTEMS

- 4MB RAM (**8MB for Pentium Systems**)
- 1.44MB 3.5" Floppy Drive
- VLB IDE controller w/2S/1P/1G
- 420MB Fast IDE Hard Drive
- VLB SVGA Card w/1MB
- Enhanced Case w/Power Supply
- 14" SVGA .28 NI Color Monitor
- Focus 2001 Keyboard
- Double Speed CD-ROM
- 16-Bit Sound Card & Speakers
- Free CD Deluxe Pak (4 Titles)
- Microsoft Compatible Mouse w/Pad
- Microsoft Windows 3.x
- Free DOS 6.x

BEST BUY

486DLC-40/128K VLB	**$1,068**
486SLC2-66/128K VLB	**$1,088**
486SX-25/128K VLB	**$1,088**
486DX-33/128K VLB	**$1,108**
486DX-40/128K VLB	**$1,118**
486DX2-50/128K VLB	**$1,128**
486DX2-66/128K VLB	**$1,188**
Pentium-60/256K VLB PCI	**$1,668**
Pentium-66/256K VLB PCI	**$1,728**
Pentium-90/256K VLB PCI	**$1,898**

UPGRADES

• 540MB Hard Drive	Add $30
• 1.0GB Hard Drive	Add $260
• 15" Non-Interlaced Monitor	Add $80
• 17" Non-Interlaced Monitor	Add $360
• 14400 Internal Fax Modem	Add $48
• 28.8 Internal Fax Modem	Add $98

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386SX-40	**$678**
386DX-40/128K	**708**
486SLC-33 ISA	**708**
486DLC-40/128K VLB	**748**
486SX-25/128K ISA / VLB	**748 / 758**
486SX-33/128K ISA / VLB	**768 / 778**
486DX-33/128K ISA / VLB	**788 / 798**
486DX-40/128K ISA / VLB	**794 / 804**
486DX2-50/128K ISA / VLB	**798 / 808**
486DX2-66/128K ISA / VLB	**838 / 848**
486DX2-80/128K VLB	**898**
486DX2-50/128K VLB - PCI	**828**
486DX2-66/128K VLB - PCI	**868**
IBM 486SLC2-66/64K VLB	**768**
IBM 486 BL-75/256K VLB	**838**
ORCHID 486DX2-66/256K VLB	**988**
Pentium P5-60/256K VLB - PCI	**1,338**
Pentium P5-66/256K VLB - PCI	**1,388**
Pentium P5-90/256K PCI	**1,558**
Pentium P5-90/256K VLB - PCI	**1,578**
Pentium P5-60/256K VLB - PCI USA	**1,418**
Pentium P5-66/256K VLB - PCI USA	**1,468**
Pentium P5-90/256K VLB - PCI USA	**1,628**
Intel Pentium P5-60/256K PCI	**1,398**
Intel Pentium P5-66/256K PCI	**1,448**
Intel Pentium P5-90/256K PCI	**1,658**

SYSTEM CONFIGURATION

- Motherboard w/CPU
- 4MB RAM (**8MB for Pentium**)
- 210MB Fast Hard Drive
- 1.44MB 3.5" Floppy Drive
- IDE 2HD/2FD Controller w/2S/1P/1G
- 512KB SVGA Card
- 14" SVGA .28 Color Monitor
- 101-Key Enhanced Keyboard
- Enhanced Case w/Power Supply
- Microsoft Compatible Mouse w/Pad
- Free DOS 6.x

BEST BUY

UPGRADES

• Microsoft Windows 3.11	Add $50
• 420MB Hard Drive	Add $50
• 540MB Hard Drive	Add $80
• 1.0GB Hard Drive	Add $300
• 14" Non-Interlaced Monitor	Add $10
• 15" Non-Interlaced Monitor	Add $80
• 17" Non-Interlaced Monitor	Add $360
• VLB IDE Controller	Add $10
• 16BIT SVGA Card w/1MB	Add $20
• Cirrus Logic/ Trident VLB w/1MB	Add $30
• Diamond S.S. Pro VLB w/1MB	Add $60
• ATI Ultra Pro PCI/VLB w/2MB	Add $180
• 250MB Tape Back-up	Add $120
• 16BIT Ethernet Card	Add $30
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• Double Speed CD-ROM w/Card	Add $120
• Sound Blaster Pro 16 MCD	Add $76
• CD Deluxe Pak (4 Titles)	Add $14
• 14400 Internal Fax Modem	Add $48
• 28.8 Internal Fax Modem	Add $98

MULTIMEDIA VLB NOTEBOOKS

- **32-BIT VL BUS Windows Accelerator**
- **Large 10.5" Screen**
- **1 MB Video Memory**
- **4MB RAM Expandable to 32MB**
- **250MB Hard Drive**
- **Built-In Trackball**
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- **Built-in Sound Card and Speaker**
- **NIMH Battery**
- **One Type III or Two Type II PCMCIA Slot**

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Super Sales	VGA Mono	Dual Scan Color	Active Matrix Color
486SX-25	$1,328	$1,758	$2,518
486DX-33	1,378	1,808	2,558
486DX2-50	1,408	1,848	2,588
486DX2-66	1,428	1,868	2,608
486DX4-100	1,698	2,128	2,888

UPGRADES

• Microsoft DOS 6.21	Add $40
• RAM 8MB / 20MB	Add 200 / 800
• Hard Drive 340MB/520MB	Add 60 / 230
• NiMH Battery Pak	Add 120
• PCMCIA Fax Modem (96/48/24)	Add 90
• PCMCIA Fax Modem (144/144)	Add 150
• Docking Station	Add 420

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- **First and Only Green Pentium System**
- INTEL Pentium Processor
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- **AMP Socket 4 ZIF Socket**
- 8MB High Speed RAM
- TEAC 1.44MB 3.5" Floppy Drive
- VLB IDE controller w/2S/1P/1G
- ATI Ultra Pro VLB/PCI 2MB (VRAM)
- 540MB Fast IDE Hard Drive
- Focus 2001 Keyboard
- 15" Viewsonic 15ES SVGA Monitor
- Medium Tower Case w/Power Supply
- Microsof Serial Mouse
- Free DOS 6.x and MS Windows 3.11

BEST BUY

Pentium P5-60/256K	**$1,898**
Pentium P5-66/256K	**$1,928**
Pentium P5-90/256K	**$2,088**

UPGRADES

• 1.0GB Hard Drive	Add $230
• ATI WinTurbo PCI /VLB w/2MB	Add $50
• Sony 15SF Monitor (Green)	Add $90
• Viewsonic 17 Monitor (Green)	Add $490
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UPS 280VA / 400VA / 600VA	108 / 158 / 248

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16-Bit Sound Card	$56
Creative Labs	
Sound Blaster Pro Value Edition	**72**
Sound Blaster Pro 16 MCD / ASP	**76 / 168**
Sound Blaster Pro 16 SCSI II / ASP	**128 / 188**
Discovery CD 16 Upgrade Kit	**234**
Edutainment CD 16 Upgrade Kit	376
Mediavision Jazz 16 (AT/SCSI)	78 / 102
Orchid Gamewave Sound Card (AT)	86
Orchid Soundwave Sound Card (AT/SCSI)	148 / 168
Chinon CDS535 (Int.) SCSI	**194**
Mitsumi FX 400 (AT) 4-Speed	**208**
NEC 3X (510) Triple Speed SCSI Int.	**238**
NEC 3Xi (500) Triple Speed SCSI Int.	**318**
Panasonic CD-562 Dual Speed	**118 (w/Card 122)**
SONY 55E Dual Speed	**112**
TEAC CD-55A (AT) 4-Speed	**234 (w/Card 244)**
Toshiba XM-3501B (SCSI) 4-Speed Int.	**288**
Toshiba XM-3501BE (SCSI) 4-Speed Ext.	**408**
Trantor SCSI Host w/Driver	**43**
Turtle Beach Monte Carlo 16-Bit (AT)	74
Audio Pak (Sound Card, Speaker, Joystick, Earphone)	50
Altek Lansing Speakers ACS50/ACS100.1/ACS300.1	64 / 96 / 218
Deluxe Speakers	6
80 Watt / 120 Watt Speakers	48 / 68

CD SOFTWARE TITLES

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5 Star Games	9
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Atlas Pak v3.1 World/US	14
Battle Chess DOS	15
Beauty & Beast MPC	11
Campton's Interactive Encyclopedia MPC	22
Carmen San Diego DOS	15
CD Deluxe Pak (Chess Master 3000, Mavis Teaches Typing, US Altas, World Atlas)	14
CD Game Pack II DOS	14
Chess Master 4000 MPC	14
Composer Quest MPC	18
Computer Supermarket	8
Desktop Publisher's Dream 1994	8
Dinosaur	16
Doom	9
Family Choice/Britannica DOS	14
Family Doctor DOS/MAC	14
Family Education Collections DOS	15
Family Fun	8
Game Galore	8
Great Cities-Vol 1 / Vol 2 DOS	16
Jones in Fast Lane MPC	13
Just Grandma and Me	14
King's Quest V DOS	10
King's Quest VI DOS	15
Kodak Photo CD Access	11
Loom From Lucas Film DOS	11
Macmillan Dictionary For Children	14
Mario is Missing/World Atlas 3.2	15
Mavis Teaches Typing MPC	13
Mayo Clinic Family Health	13
Microsoft Bookshelf MPC 1993	27
Microsoft Bookshelf MPC 1994	38
MIDI Music Shop	14
Mixed-up Mother Goose MPC	11
Monkey Island DOS	11
MPC Audubon's Mammals	13
National Geographic Mammals DOS	16
National Park	16
PC SIG 12th Edition	18
Peter & Wolf MPC	12
Playing with Language (English)	15
Playing with Language (French)	15
Playing with Language (German)	15
Playing with Language (Japanese)	15
Playing with Language (Spanish)	15
Return to Zork	16
Secret Weapons/Luftwf DOS	11
Sleeping Beauty	11
So Much Shareware IV DOS	17
Sound Library MPC	8
Space Quest IV By Sierra DOS	14
Star Trek: 25th Anniversary	18
Star Wars Chess & MPC	16
Survey of Western Art MPC	20
Time Table of History DOS	14
Tool Works Reference Library	14
Top 201 Games	9
Travel to Space	8
US Air Power	8
US Aircraft Carrier	8
US Atlas v3.1 MPC	12
US Bomber	8
US History DOS/MAC	14
USA Wars: Civil War DOS/MAC	20
USA Wars: Vietnam DOS/MAC	20
USA Wars: WW II DOS/MAC	20
USA Wars: Korea	20
Willy Bearnish The Adventure	12
Window Program	8
World Atlas v3.2 MPC	12
World of Education	8

CONTROLLERS

I/0 2S / 1P / 1G	**$10**
IDE 2FD/2HD with 2S/1P/1G	**10**
PCI IDE (enhanced)	**17**
PCI IDE with I/O	**36**
VLB IDE with I/0	**16**
Enhanced I/O (2S/1P) w/16550 UART Chip	24
IDE I/O (2S/1P) w/16550 UART Chip	30
VLB IDE I/0 (2S/1P) w/16550 UART Chip	**36**
Adaptec	
1522 / 1542CF (SCSI)	**69 / 152**
1542CFK w/Kit (SCSI)	**220**
2742T EISA (Twin SCSI)	228
2842 VLB SCSI	**218**
2940K PCI	**184**
2940W (Wide SCSI)	260
BusLogic 445S VLB (SCSI)	194
DTC 2290 EISA IDE	108
DTC 2280 ISA IDE	14
DTC 2278 VLB IDE	20
Promise DC-200 IDE Cache Controller	**84**
Promise DC-420 VLB w/512K Cache	96
Promise DC-2300 Plus VLB IDE Fast I/O	52
Promise DC-4030 VLB IDE Cache Controller	**96**

HARD / FLOPPY DRIVES

210 MB 15MS IDE	**$134**
250MB 15MS IDE	**138**
340MB 12MS IDE	**148**
420MB 12MS IDE	**178**
540MB 12MS IDE	**208**
850MB 12MS IDE	**328**
1.0GB 10.5MS IDE	**434**
200MB 13MS / 340MB 13MS SCSI	178 / 208
540MB 12MS SCSI	228
1.0GB 13MS SCSI	**478**
1.8GB 13MS / 2.0GB 13MS SCSI	**828 / 928**
Teac 1.2 / 1.44 Floppy Drive	41 / 31
Epson or NEC 1.2 / 1.44 Floppy Drive	**39 / 29**
TEAC Dual Floppy Drive	84
3.5" DS/HD High Density Diskettes 10 Pack	**4**

KEYBOARDS

101 Enhanced Keyboard	$13
Focus	
FK2001 101-Key Click	**30**
FK8000 w/Calculator	33
FK9000 Programmable.	45
Keytronics 101-Key Enhanced	**22**
Mitsumi 101-Key Enhanced	**13**
Maxiswitch 101-Key Enhanced	**20**
Maxipro II Programmable	45
Northgate	
OMNI 101 NI / 102 / Ultra	**63 / 63 / 82**

MATH COPROCESSORS

387DX-40 (Tube / Box)	**$28 / 38**
387DX-33 (Tube / Box)	**10 / 38**
387SX-40 (Tube / Box)	26 / 38
387SX-33 (Tube / Box)	**14 / 38**

MODEMS & FAXES

Fax Modem (9648 Fax/2400 Modem)	$24
Fax Modem (9600 Fax/2400 Modem)	**28**
Fax Modem (14,400 Fax/14,400Modem) Int.	**48**
Fax Modem (14,400 Fax/14,400Modem) Ext.	**68**
Fax Modem 28.8 (28.8 Data, 14.4 Fax) Int	**98**
Fax Modem 28.8 (28.8 Data, 14.4 Fax) Ext	128
Fax Modem 28.8 with V.34 Int.	148
Fax Modem 28.8 with V.34 Ext	158
Fax Modem (9648/24) for Notebook	68
Hayes 14400 Fax Modem Int/Ext	**98 / 118**
PCMCIA Fax Modem (14400) for Notebook	**108**
US Robotics	
Sportster 14400 Fax Modem Int / Ext	**94 / 108**
Sportster 28.8 Fax Modem Int / Ext	**188 / 198**

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14" Mono	**$66**
14" VGA Mono	80
14" Super VGA 1024•768 .39	**170**
14" Super VGA 1024•768 .28 Int	190
14" Super VGA 1024•768 .28 NI	**200**
15" Super VGA 1280•768 .28	**268**
17" Super VGA 1280•768 .28	**544**
CTX	
14" Super VGA 1024•768 .28 Int	210
14" Super VGA 1024•768 .28 NI	224
CMS1562GM 15" 1280•1024 .28	**304**
CPS1765GM 17" 1280•1024 .27	598
Hitachi CM1586 15" 1024•768 .28	418
MAG	
15F 15" 1280•1024 .28	**344**
17F 17" 1280•1024 .26	**608**
NANAO	
F550IW 17" 1280•1024 .28	**868**
T560I 17" 1280•1024 .25	1,374
F560IW 17" 1280•1024 .26 TRIN	1,146
F760IW 21" 1280•1024 .31	1,798
NEC	
3V 15" 1024•768 .28	448
5FGe 17" 1024•768 .28	936
XE 15 / XP 15	528 / 658
XE 17 / XP 17	948 / 1,228
XE 21 / XP 21	1,978 / 2,338
OPTIQUEST	
900S 14" 1024•768 28	248
1562A 15' 1024•768 .28 Flat	338
4000DS 17' 1280•1024 .27 Flat	648
2082DC 20" 1600•1280 .28	1,238
SONY	
15SF 15" 1280•1024 .25 Green	**404**
17SF 17" 1280•1024 .25	**838**
17SE1 17" 1600•1280 .25	**892**
20SE1 20" 1600•1200 .30	1.754
VIEWSONIC	
6E 14" 1024•768 .28 Green	**244**
15ES 15" 1024•768 .28	316
15EX 15" 1024•768 .28 Green	**336**
15G 15" 1280•1024 .28 60MHz	354
15 15" 1280•1024 .27 Green	382
17 17" 1600•1280 .27 Green	798
17E 17" 1280•1024 .28 Green	658
17G 17" 1280•1024 .28 Green	688
20G 20" 1600•1280 .28	1,238
21 21" 1600•1280 .25	1.598

MOUSE / SCANNER

3-Button Microsoft Compatible	**$6**
Logitech	
Cordless	80
First Mouse	25
Mouseman Serial (Original)	**20**
Mouseman Bus (Original)	**62**
Trackman	72
Scanman 256 Gray Scale	148
Scanman Color	258
Microsoft Mouse Serial (w/System)	**20**
Microsoft Bus (w/System)	**54**

NETWORK

16 BIT Ethernet Cards (Coax)	**$24**
16 BIT Ethernet Cards (10 Base-T)	**30**
16 BIT Ethernet Cards (Combo)	**31**
16 BIT Ethernet Cards (Pocket for Notebook)	98
3COM	
3C509 ELINK III Coax / 5 pack	104 / 458
3C509 ELINK III TP / 5 pack	104 / 418
3C509 ELINK III Combo / 5 pack	120 / 498
ARCnet	
Bus Topology ISA Card (8 BIT / 16 BIT)	.40 / 45
Star Topology ISA Card (8 BIT / 16 BIT)	.40 / 45
Hubs and Repeaters	
8-Port 10 Base T HUB (w/BNC)	124
12-Port 10 Base T HUB (w/BNC, AUI)	264
16-Port 10 Base T HUB (w/BNC, AUI)	328

PRINTERS

Citizen	
GSX-190 (9-Pin) / GSX-220 (24-Pin)	**$158 / 166**
GSX-230 / GSX-240 (24-Pin) Quiet	218 / 284
GSX-245 (24-Pin) Wide	348
Color Option for Citizen Printers	48/68
Hewlett-Packard	
HP DeskJet 540 / 560C	292 / 468
HP DeskJet 1200C	1,278
HP LaserJet 4 / 4 Plus	1,218 / 1,368
HP LaserJet 4L / 4P	638 / 928
HP LaserJet 4MP	1.308
Panasonic	
KX-P1150 (9-Pin)	**134**
KX-P2023 (24-Pin) Quiet	180
KX-P3624 (24-Pin) Wide	398
Color Upgrade Kit KX-PCK11	52

TAPE BACKUP

Conner 250MB Int	**$116 (w/tape$124)**
Colorado	
DJ-10 Tape Back-up 120MB	96
DJ-20 Tape Back-up 250MB (OEM/ORIG)	**144/146**
DJ-35 Tape Back-up 350MB	**166**
Tape QIC-80 3M DC2120	**12**
JT-20 Trakker 250MB Ext	**276**
JT-35C Trakker 350MB Ext	318
PT-25 Power Tape 2.4GB Int	898
PT-50 Power Tape 4GB Int	1,098

VGA CARDS

VGA 256K / 512K	$24 / 34
SVGA 1MB 1024•768 16 BIT	**52**
Window Accelerators w/1MB	52
Trident / S3-805 VLB w/1MB	**61 / 63**
ATI	
Wonder PCI / VLB 1MB DRAM	**98**
Ultra Plus PCI / VLB / ISA 2MB DRAM	158
Ultra Pro PCI 2MB VRAM (Mach 32)	**208**
Ultra Pro VLB 2MB VRAM (Mach 32)	**205**
Ultra Pro EISA 2MB VRAM (Mach 32)	**252**
WinBoost PCI / VLB 1MB DRAM (Mach 64)	**138**
WinBoost PCI / VLB 2MB DRAM (Mach 64)	**178**
WinTurbo 64 PCI / VLB 2MB VRAM (Mach 64)	**.250**
WinTurbo 64 PCI / VLB 4MB VRAM (Mach 64)	**.448**
Diamond	
Speed Star Pro 1MB ISA	**84**
Speed Star SE PCI / VLB 1MB DRAM	**94**
Speed Star SE PCI / VLB 2MB DRAM	**138**
Stealth 24 VLB 1MB	114
Stealth 64 PCI 1MB / 2MB (DRAM)	118 / 164
Stealth 64 VLB 1MB / 2MB (DRAM)	118 / 174
Stealth 64 PCI / VLB 2MB (VRAM)	264 / 264
Stealth 64 PCI 4MB (VRAM)	388
Viper 2MB VLB	**244**
Viper 2MB PCI	**244**
Genoa 8500 VLB 1MB	85
Orchid	
Celsius VLB 1MB / 2MB	**88 / 148**
Fahrenheit 1MB (S3-801) ISA	118
Fahrenheit 64 PCI /VLB 1MB (DRAM)	138
Fahrenheit 64 PCI /VLB 2MB (DRAM)	178
Fahrenheit 64 Pro PCI / VLB 2MB (VRAM)	270
Fahrenheit 64 Pro PCI / VLB 4MB (VRAM)	400
Kelvin ISA 1MB	119
Kelvin EZ PCI / VLB VLB 1MB (DRAM)	**94 / 94**
Kelvin VLB (64-Bit) 1MB / 2MB	**119 / 168**
Kelvin PCI (64-Bit) 1MB / 2MB	**119 / 168**

HOURS: Monday - Friday: 8:30am to 6pm / Saturday: 10am to 4pm

TERMS AND CONDITIONS

1. One year parts and labor warranty on systems.
2. Knowledgeable technical support engineers in service.
3. Prices and availability subject to change w/o notice.
4. Shipping, insurance and COD charges are extra and non-refundable. Prices reflect cash discounts.
5. Return shipping must be insured, prepaid and bearing an RMA# on the shipping label.
6. Defective items replaced or repaired at our discretion.
7. No responsible for typos.
8. All returns subject to 15% restocking fee and cover only Hi-Tech USA brand computers, excludes peripherals and software. No refunds after 30 days.
9. Superior reputation for service, quality and value
10. Purchase orders are welcomed and subject to approval

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Capital
HWY 680
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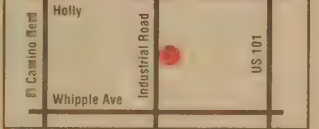
1558 & 1562 Centre Pointe Drive
Milpitas, CA 95035 Fax (408) 262-8772

HI-TECH USA

PENINSULA



Phone (415) 508-8688
981B Industrial Road
San Carlos, CA 94070 Fax (415) 508-0383

MOSAIC & NETSCAPE

continued from page 208

WE WANT TO MAKE IT EASIER FOR PEOPLE TO BUILD APPLICATIONS THAT INVOLVE COMMUNICATION.

can be a wide variety of ways to organize and find things. I think that over time that is going to be a service that people are going to be able to offer, particularly in the new Internet where people will be able to offer that as a value-added service. It will be a business of providing indexes. Vannevar Bush predicted this forty or fifty years ago. There would be people called Trailblazers whose specialties would be sifting through the global information space and finding all the interesting things. Charting new trails through the hypertext. I think that is going to be an interesting business to be in at some point.

What do you see as the threats to Netscape Communications? Is it the competition doing things better or will it be a totally new scenario or technology?

It is going to be an interesting tradeoff over the next few years. With the market growing as rapidly as it is, it is hard to differentiate between competition and somebody else doing something to grow the market even more. A lot of what the other companies are doing, including companies like EIT, is not only complementary but probably very beneficial to us because it is growing the environment. We will see what happens over the long term. There is no question the software is fiercely competitive, overall. But in a phase of rapid growth like this there are lots of opportunities for lots of people.

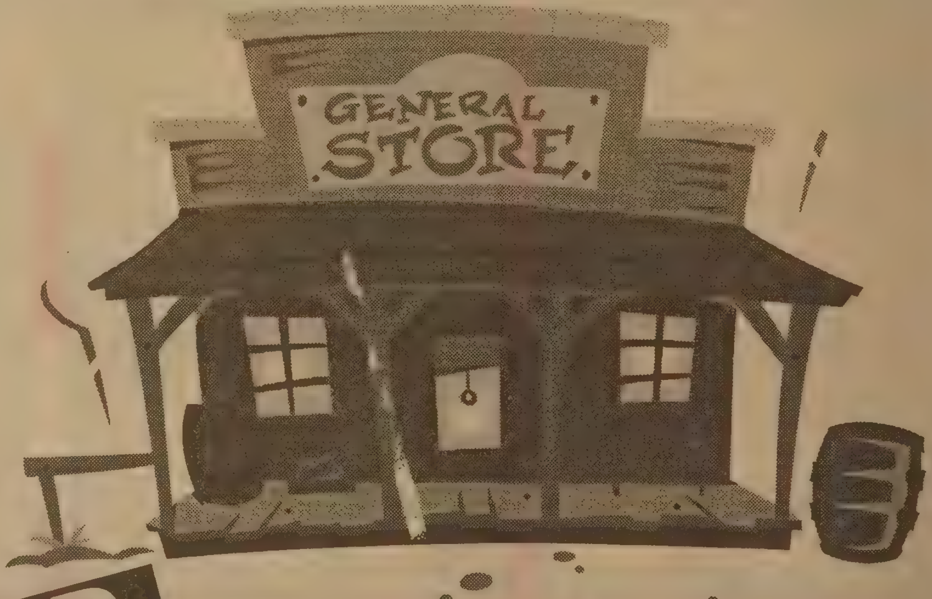
In the beginning of this you mentioned that one of the goals with Mosaic and Netscape was to pull together all the resources of the Net. With the growth of a variety of server technologies, client software, and the development of information access roadblocks or toll bridges, do you foresee the Net fragmenting

Those are not roadblocks. That's new road that wasn't there before. Tha service would simply not be there there wasn't a way for them to charge fo it. When you have an environmen where all information is free, you get lot of worthless information. You get lot of interesting things happening community spaces, lots of people inte acting. But as far as information space go, it is mostly landfill. What's happen ing with the ability to charge is that t diversity of resources available expanding, and will continue to expan If you want to be a traditional user of t Internet and not pay tolls, then y don't access those resources, but the wouldn't have been there anyway. Th fact that they are there and there is th business that can be built around the means that the entire Net benefi because the infrastructure itself grow So you win either way. ■

HOW MUCH RAM DO I NEED?

Seems like today everybody's getting into the business of selling computer upgrades. But how do you know where to go for the best prices and the best deals? Let's face it, you need help. Better read MicroTimes. MicroTimes is your general store of computer information.

READ MICROTIMES™


GENERAL STORE.

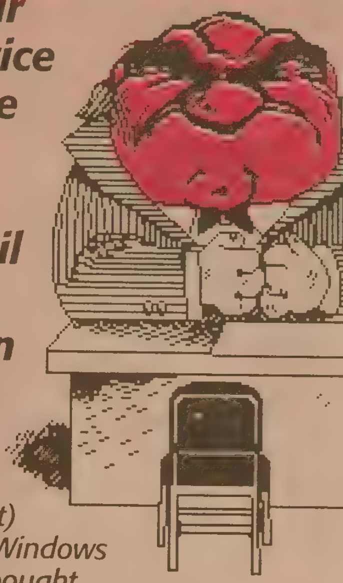
NOW

NOW ELECTRONICS, INC.

NEW LOGO, OLD PROS.

- WE ARE CHANGING OUR LOGO
- WE ARE ADDING MORE PERSONNEL
- WE ARE EXPANDING OUR OPERATIONS
- WE ARE IMPROVING OUR SUPPORT
- AND YOU ARE THE WINNER!

We could turn RED in the face advising you that our Computers and Service are better than those of Mail Order Companies, but you might not listen, until you go through the experience and learn it the hard way!



We run into them daily, those sad confused faces, carrying around books like "DOS for Dummies" or "I/O Jumper Setting" that are written in some kind of language, asking us for help (regardless of the cost) to install a game or a Fax/Modem into their Mail order computer. Or those Power Users who can't load Windows NT or 3D Studio because their video drivers are NOT compatible with their "Dirt Cheap" computer they bought from a "Mom and Pop" store down the street. The truth is this; computers are not an appliance, they are active devices, they need attention, often upgraded and often needing service. Therefore, you need a company that knows computers, a person that knows who you are and what computer you have, a company that treats you as a customer not as a serial number. We believe that Silicon Valley professionals should buy their computers from a Silicon Valley company, not from a company that is thousands of miles away, or a store that sells computers along with potato chips. At NOW we are dedicated and determined to provide you with the highest quality most reliable computers and an old fashion service that is unmatched anywhere on earth.

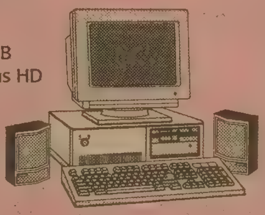
NOW Electronics is what makes a PC ....Personal!

MULTIMEDIA PCs

INSPIRATION

66MHz i486DX2, 15" Monitor
2X CD-ROM Multimedia Kit

Inspire the whole family with this low cost, high performance Multimedia PC. It provides you with all the goodies to make you explore the world of multimedia for just under $2000. It's a deal you can't afford to let go.



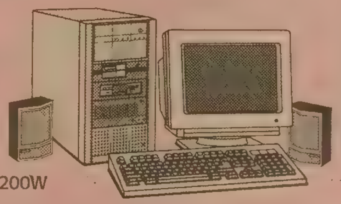
. **Intel i48DX2/66MHz** CPU 8K Cache
. ASUS VLB Green Motherboard
. 256KB Write back static cache
. 8MB 72-pin 70ns RAM up to 128MB
. 540MB E-IDE **Western Digital** 12ms HD
. 1.44MB High Density Floppy Drive
. 15" **ADI** or **MAG** Flat .28dp NI Monitor
. **Diamond Stealth64** VLB 1MB Video
. Promise Tech VLB E-IDE Controller
. Desk-Top or Mini-tower Case w/ 200W PS
. 101 Enhanced **Mitsumi** keyboard
. **Logitech** high-resolution mouse
. 16-bit Sound Blaster Card
. Double Speed CD-ROM Drive
. High performance Stereo Speakers
. Grolier Encyclopedia, Indianapolis 500, Lemmings, Creative Screen Singer, Aldus PhotoStyler SE & Gallery Effects, Altamira Composer, Kai's Power Tools, Digital Morph and more!
. DOS 6.22 & Windows FWG 3.11 w/ manuals
. 4-Years Parts and On-Site Service Warranty

$1995

TEMPTATION

60MHz Pentium , 15" Monitor
4X CD-ROM, 28.8KB F/M

We understand, it is very tempting, but it is very rewarding to you and to everyone in your family. This low cost Pentium based multimedia computer can make your average "Couch Potato" person transform into "Desktop Potato"!



. **Intel Pentium 60MHz** Processor 16K Cache
. Intel **Premiere/PCI** Revenge 64-bit Motherboard
. 256KB Write back static cache
. 8MB 72-pin 70ns RAM up to 128MB
. 540MB E-IDE **Western Digital** 12ms Hard Drive
. 1.44MB High Density Floppy Drive
. 15" **ADI** or **MAG** Flat .28dp NI Monitor
. **Diamond Stealth64** PCI 1MB Video Card
. Integrated PCI E-IDE controller
. Deluxe Mini-tower Case w/ 200W PS
. 101 Enhanced **Mitsumi** keyboard
. **Logitech** high-resolution mouse
. **Zoltrix** 28.8KB Fax/Modem w/ Software
. Quad Speed CD-ROM Drive (600KB/sec)
. Diamond 16-bit CD-quality Sound Card
. High Performance Stereo Speakers
. Clip-on Microphone and Head phones
. Over 30 CD Titles including Compton's Interactive Encyclopedia, Sim City 2000, Myst, Rebel Assault SE, Mega Race, Carmen San Diego, Family Doctor, 10 Hot Games and more!
. DOS 6.22 and Windows FWG 3.11 w/ Manuals
. 4-Years Parts and On-Site Service Warranty

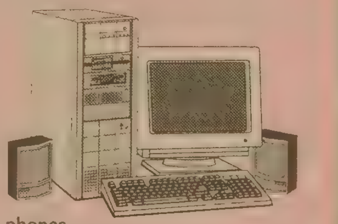
$2795

pentium

ENVISION

90MHz Pentium, 17" Monitor
4X CD-ROM, 28.8KB F/M

Envision this: Browsing through the library of congress at the speed of light, retrieving text, pictures, video, clip arts, and animation on to your large 17" Screen and your 28.8KB Modem.. Well your dream has just come true, our "Envision" multimedia computer will provide you with all the tools necessary to explore the world of multimedia.



. **Intel Pentium 90MHz Processor** 16K Cache
. Intel **Premiere/PCI Plato** 64-bit Motherboard
. 256KB Write back static cache
. 16MB 72-pin 70ns RAM up to 128Mb
. 700GB E-IDE **Western Digital** 10ms Hard Drive
. 1.44MB High Density Floppy Drive
. 17" **ADI** A5p .26dp Flat NI Monitor
. **ATi Ultra Pro Turbo Mach64** PCI 2MB
. Integrated PCI E-IDE controller w/ Fast I/O
. Deluxe Medium-tower Case w/ 230W PS
. 101 Enhanced **Key Tronic** keyboard
. **Microsoft** Ergonomic mouse
. **Zoltrix** 28.8KB Fax/Modem w/ Software
. Quad Speed CD-ROM Drive (600KB/sec)
. Diamond 16-bit CD-quality Sound Card
. High Performance Stereo Speakers
. Clip-on Microphone and Head phones
. Over 30 CD Titles including Compton's Interactive Encyclopedia, Sim City 2000, Myst, Rebel Assault SE, Mega Race, Carmen San Diego, Family Doctor, 10 Hot Games and more!
. DOS 6.22 and Windows FWG 3.11 w/ Manuals
. 4-Years Parts and On-Site Service Warranty

$3995

pentium

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FAX: 408/654-9463
2370 Owen Street
Santa Clara, CA 95054
Hours: M-F 9-6/ Sat.11-4

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FAX: 510/803-9790
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TEL: 415/345-4577
FAX: 415/345-4576
2031 Pioneer Court Ste. 2
San Mateo, CA 94403
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SAN FRANCISCO
TEL: 415/398-8106
FAX: 415/398-8239
425 Battery Street, Ste. 210
San Francisco, CA 94111
Hours: M-F 10-5/ Sat.11-4

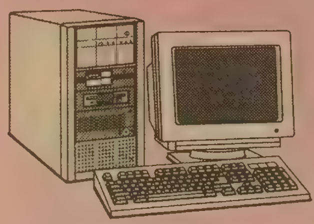
☞ MAPS

intel inside pentium

The Best Buys On Pentium 66/90/100 MHz Systems

MARVEL

Pentium 66MHz or 90MHz, 15" Monitor



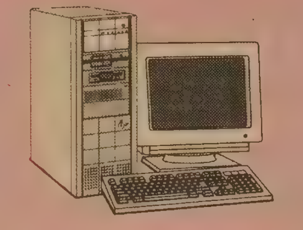
Low cost, high performance Pentium processor based system. Designed for those who strive for the Pentium power but are on a tight budget.

. **Intel Pentium** Processor 16K Cache
. Intel **Premiere**/PCI 64-bit Motherboard
. 256KB Write back static cache
. 8MB 72-pin 70ns RAM up to 128MB
. 540MB E-IDE **Western Digital 12ms** Hard Drive
. 1.44MB High Density Floppy Drive
. 15" **ADI or MAG** Flat .28dp NI Monitor
. **Diamond Stealth64** PCI 1MB Video Card
. Integrated PCI E-IDE controller
. Deluxe Mini-tower Case w/ 200W PS
. 101 Enhanced **Mitsumi** keyboard
. Pentium OverDrive ZIF Socket
. **Logitech** high-resolution mouse
. DOS 6.22 and Windows FWG 3.11 w/ Manuals

66MHz $2095
90MHz $2295

MIRAGE Pentium 90MHz

540MB Fast SCSI-2 #9GXe 64



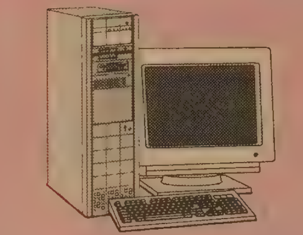
No it's not an illusion, It's real! The Mirage combines 90MHz Pentium, Maxtor 8.5ms SCSI Hard Drive, 16MB RAM and #9GXe 64 and is still priced below $2900. Designed to satisfy the needs of power hungry/tight budget users who need the power of Pentium and the features of SCSI.

. **Intel Pentium 90MHz** Processor 16K Cache
. Intel **Premiere/PCI** Plato 64-bit Motherboard
. 256KB Write back static cache
. **16MB** 72-pin 70ns RAM up to 128MB
. 540MB Fast SCSI-2 **Maxtor** 8.5ms Hard Drive
. 1.44MB High Density Floppy Drive
. 15" **ViewSonic 15ex** Flat .28dp NI Monitor
. Number Nine **#9GXe 64** PCI 2MB Video Card
. NCR PCI Fast SCSI-2 Controller w/Fast I/O
. Deluxe Medium-tower Case w/ 230W PS Dual Fans
. 101 Enhanced **MaxiSwitch** keyboard
. **Microsoft** Ergonomic mouse
. DOS 6.22 and Windows FWG 3.11 w/ Manuals
. 4-Years Parts and On-site Service Warranty

$2895 Maxtor DRIVEN BY THE BEST

MOSAIC Pentium 90MHz

1.0GB Hard Drive, 17" Monitor



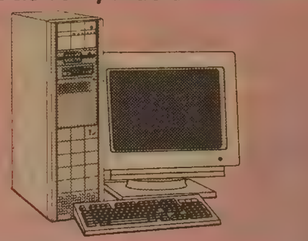
The Mosaic does not come short on any of its features, with 16MB RAM, 17" Flat screen and 1 Gigabyte of hard drive, this system will accommodate your expanding needs for many years to come.

. **Intel Pentium 90MHz** Processor 16K Cache
. Intel **Premiere/PCI Plato** 64-bit Motherboard
. 256KB Write back static cache
. 16MB 72-pin 70ns RAM up to 128MB
. 1.0GB E-IDE **Western Digital** 10ms Hard Drive
. 1.44MB High Density Floppy Drive
. 17" **MAG** Flat .28dp NI Monitor
. ATi Ultra Pro Turbo **Mach64** PCI 2MB
. Integrated PCI E-IDE controller w/ Fast I/O
. Deluxe Full-tower Case w/ 250W PS Dual Fans
. 101 Enhanced **Key Tronic** keyboard
. Pentium OverDrive ZIF Socket
. **Microsoft** Ergonomic mouse
. DOS 6.22 and Windows FWG 3.11 w/ Manuals
. 4-Years Parts and On-site Service Warranty

$3395 ATi TECHNOLOGIES INC

MAJESTIC II 100MHz Pentium

Adaptec 2940W, Matrox MGA Plus



As the name implies, the Majestic is a superior system. It integrates the finest made motherboard, controller, Video and monitor. It also features the Fast & Wide technology to achieve DTR of 20MB/sec burst and 5MB/sec sustained. Ideal for complex video and audio multimedia applications where uninterrupted data transfer is essential.

. Intel **Pentium** 100MHz Processor 16K Cache
. **Micronics M54P1** 64-bit Motherboard
. 256KB Write back static cache
. **16MB** 72-pin 70ns RAM up to 128MB
. 1.0GB **Fast & Wide SCSI-2 Fujitsu** 9ms Hard Drive
. **Adaptec 2940W** or **Qlogic** RISC Based PCI
  Fast Wide SCSI-2 Controller **(20MB/sec DTR)**
. 1.44MB High Density Floppy Drive
. 17" **IDEK** .26dp 1600x1280 Monitor
. Matrox **MGA Ultima Plus** with 4MB Video RAM
  Option: **ATi Mach64** or **ViperPro SE**
. Deluxe Full-tower Case w/ 300W PS Dual Fans
. 101 Enhanced **Key Tronic** keyboard
. **Microsoft** Ergonomic mouse
. DOS 6.22 and Windows FWG 3.11 w/ Manuals
. 4-Years Parts and On-site Service Warranty

$4495 MICRONICS

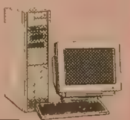
High-End Graphics & Multimedia Stations

SUPERSTATION

ViewSonic AIR

Single Pentium 90/100MHz
EISA/PCI 64-bit Architecture
2.1GB Fast & Wide Barracuda
21" ViewSonic 21 1600x1280 .25dp Monitor

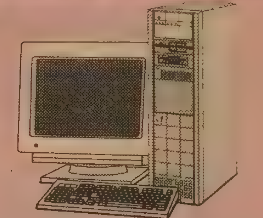
. Intel **Pentium 90/100MHz** Processor 16K Cache
. **AIR** EISA /PCI 64-bit Motherboard
. 512K KB Write back static cache
. 16MB 72-pin 70ns RAM up to 128MB
. 2.1GB **Seagate** Fast Wide SCSI-2 9ms
. Built-in Fast Wide SCSI-2 **(20MB/sec DTR)**
. 1.44MB High Density Floppy Drive
. 21" **ViewSonic** 21 1600x1280 .25dp Monitor
. **Diamond Stealth64** 4MB VRAM Video
. **GT-300** Case 300W PS Triple Fans w/ doors
. 101 Enhanced **Key Tronic** keyboard
. 4-EISA/ISA and 3-PCI Slots
. **Microsoft** Ergonomic mouse
. DOS 6.22, Windows 3.11 FWG
  w/ manuals



90MHz $5995

STATION2000AV

Audio/Video Production Computer
90/100MHz Pentium
21" Nokia 445X Monitor
Diamond Viper Pro Video
Micropolis 2.0GB A/V HD

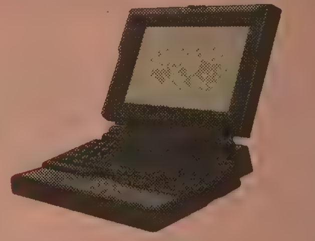


It's what the Pros asked for, our new Station2000AV is designed to provide you with the technology and components necessary to start or improve your Video/Audio production business. We have done the research for you, all you have to do is work. By the way, if the price is out of your budget, we can configure a smaller version of this station that still provides all the A/V features.

. **Intel Pentium 90/100MHz** Processor 16K Cache
. Intel **Premiere/PCI Plato** 64-bit Motherboard
. 256KB Write back static cache
. **32MB** 72-pin 70ns RAM up to 128MB
. **Micropolis** 2.0GB MC2210AV 10ms Hard Drive
. **Adaptec 2940** PCI Fast SCSI-2 Controller
. 1.44MB High Density Floppy Drive
. 21" **Nokia** 445X 1600x1280 120MHz Monitor
. **Diamond Viper Pro** Video PCI 4MB VRAM True
  color at 1280x1024, 30 fps video play back
. Deluxe Full-tower Case w/ 300W PS
. 101 Enhanced **Key Tronic** keyboard
. **Logitech** Ergonomic MouseMan
. DOS 6.22 and Windows FWG 3.11 w/ Manuals

$7395 MICROPOLIS NOKIA DIAMOND MULTIMEDIA

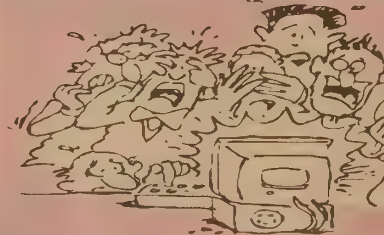
100MHz /DX4 NOTEBOOK



. i486DX4/100MHz CPU
. 8MB up to 20MB
. 540MB Hard Drive
. 9.5" Active Matrix TFT color
. Local Bus Video interface
. 1.44MB removable floppy
. Trackball
. 14.4/14.4 Fax/Modem
. MS DOS/Windows

$3895

Things That Make You Go Hmmmm!!! #4



At Now We Care To Educate You!

■ Check this out, there is a new breed of hard drive described as "Thermally Calibrated" hard drives, designed for use in multimedia applications. For those who don't know what this is, here is an overview. Thermal Calibration is the process by which the hard drive maintains the data heads at an optimal position over the data cylinders. This is done by breaking the calibration process into smaller components and eliminating video frame drop outs and jerkiness. Hard drives that do not have this feature will require a longer time to complete a thermal calibration over the cylinder, long enough to cause an interruption of the data flow which results in disc-related audio or video drop-outs and jerkiness. Many of our high-end computers integrate Thermally Calibrated Hard drives.

■ Windows For Workgroups 3.11 has a nice feature that many of you might not have known about, or simply can not use. If you go into the "Control Panel" under "386 Enhanced" then choose "Virtual Memory"... and then click on "Change", you will see two boxes, one reads "Use 32-bit Hard Drive Access" and the other reads "Use 32-bit File Access". Enabling those two could increase your system's performance by 50%. Enabling the "Use 32-bit Disk Access" will cause Windows to interact directly with your hard drive, however, unless your hard drive and controller are designed to take advantage of this feature you will not be able to use it. (e.g. SCSI Hard drives). On the other hand, a "32-bit File Access" is a feature that everyone should be able to utilize. (For more info regarding this issue, contact Microsoft Fast tips at 800-936-4200).

■ Internet is becoming a buzzword to everyone these days, from children to adults to seniors, although few actually understand how the Internet works, but all have the intention to learn. It is quite interesting to know how the Internet initially started, and here is the story. In the early 1960's, because of fear of a Nuclear attack, the pentagon asked computer scientists to find a way for an unlimited number of computers to communicate together-without relying on a single computer or "Head" to control them, so that in case one part got hit the others will stay alive. Quickly, after this technology was implemented in research labs, it expanded to dozens of universities and corporations creating what is called today the Internet. Now and with the help of TCP/IP, Internet traffic can move over almost all physical channels, telephone lines, Cable TV, Satellite links, wireless phones and fiber optic trunks to all types of mainframes, workstations and PCs, reaching millions and millions of people all over the world.
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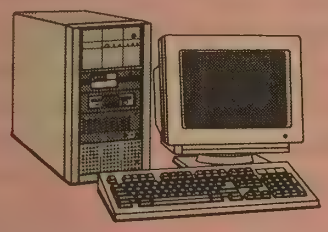

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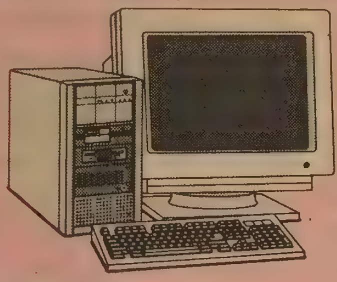

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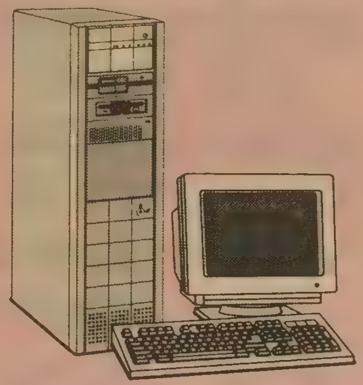

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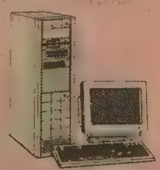

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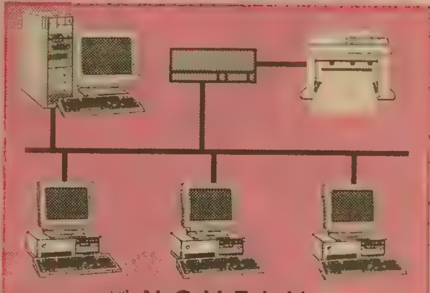

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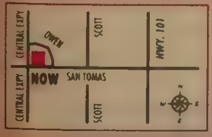

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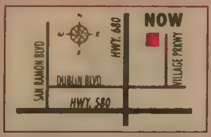

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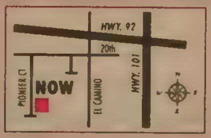

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continued from page 232

> COMPUTERS WILL OVERCOME THE OLD ADVANTAGES OF WEALTH, SOCIAL NETWORK, AND TUTOR-INFLATED SATS. DATABASES ARE SUPERIOR TO SCHOOL TIES, SIMULATION SOFTWARE BETTER THAN A CLOISTER OF B-SCHOOL WONKS, ONE WORKAHOLIC WITH A 3-D COMPUTER MORE PRODUCTIVE THAN MANY CORPORATE R&D CENTERS

over wisdom, reading vs. other information input? (Yes.) Does it account for test-taker motivation? (No.) Is it a snapshot in time, of little relevance over a long, unfolding career? (Yes.) Does it measure energy, salesmanship, confidence, the ability to defer gratification, the courage to defy conventional wisdom? (No.)

IQ is a very rough sorter of success. Enterprise itself is much better. Go to any Mensa meeting (or to any college social sciences department). It's full of cranks and high-domes annoyed at the world for not rewarding IQ as richly as market skills. Put another way, would you invest in IQ? Would you make it 40% to 80% of your investing criteria—the proportion that IQ (Murray tells us) contributes to success in life?

I doubt that the canniest investor the information economy has yet produced even gave IQ a thought. Whatever you think of Michael Milken, he had a keen eye for information-age entrepreneurs. Milken's junk bonds, a broadly democratic form of venture capital, have produced $800 billion in wealth from the mid-1980s to the present. Who did Milken bet on? Bill McGowan, Ted Turner, Craig McCaw. Dyslexics, divorcees, depressives, dropouts—the kind Murray associates with low IQ.

Technology: Boon, Not Bane

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Diversity, because a networked digital world favors niche markets and first choices over mass culture and compromised pickings.

Energy, imagination, and street smarts, because computers will overcome the old advantages of wealth, social network, and tutor-inflated SATs. Databases are superior to school ties, simulation software better than a cloister of B-school wonks, one workaholic with a 3-D computer more productive than many corporate R&D centers.

Moreover, as microprocessors continue their rampant march, computers will contain the oomph to host a variety of user interfaces, tailored to the individual. Computers today (like IQ tests and university grades, but not necessarily like the marketplace) favor the literate and the logical. What if you are visual, aural, and intuitive? Today you're shut out. Tomorrow you won't be.

I would hate to see the IQ worrywarts blame computers and broadband networks (as many blame free trade today) for a skewing of wealth and poverty and try restraining them. These tools are not society's villain, but its best hope.■

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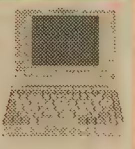

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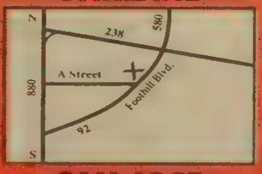

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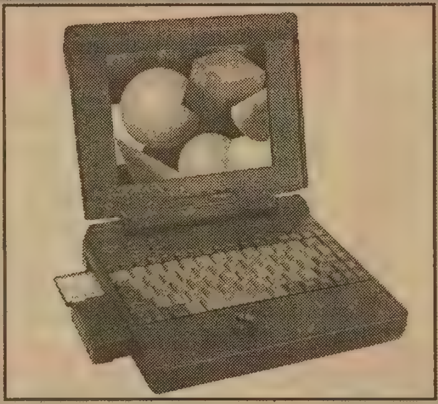
DUAL SCAN	PENTIUM 66	2599	2679	2839
ACTIVE MATRIX	PENTIUM 60	3559	3619	3779
ACTIVE MATRIX	PENTIUM 66	3659	3699	3859

ACCESSORIES:

8MB RAM	$395	PCMCIA Ethernet Card Coax/UTP	205
16 MB RAM	835	Ni-Metal Battery	140
32 MB RAM	1595	External Numeric Keypad	65
PCMCIA Fax 96/48/24	139	On-Site Service 1 Year	35
PCMCIA Fax 14.4/14.4	199		

486 VESA LOCAL BUS MULTIMEDIA NOTEBOOK



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- Built-In Trackball Mouse
- Built-In Speaker & Microphone
- Docking Station Option
- 6.2 Lbs

CPU TYPE	MONO	DUAL SCAN	ACTIVE MATRIX
486SX-25	$1279	$1775	$2599
486SX-33	1325	1825	2659
486DX2-66	1399	1899	2579

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Upgrade To 540 MB	Add 330	PCMCIA Fax Modem 14.4/14.4	199
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- 256K Cache Expandable to 512K
- 4 MB RAM Expandable to 128 MB
- 1.44 MB Floppy Drives
- 420 MB IDE Hard Drive
- PCI IDE Controller Card
- I/O with 2 Serial, 1 Parallel, 1 Game
- Orchid Kelvin PCI w/1 MB RAM
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- 101 Enhanced Keyboard
- Mid Tower Case w/230W PS

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- 210 MB IDE Hard Drive
- Vesa Local Bus 32 Bit IDE Cont 2H/2F I/O with 2 Serial, 1 Parallel, 1 Game
- VESA Local Bus SVGA Card w/1 MB RAM
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- 101 Enhanced Keyboard
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- 3 Button Mouse

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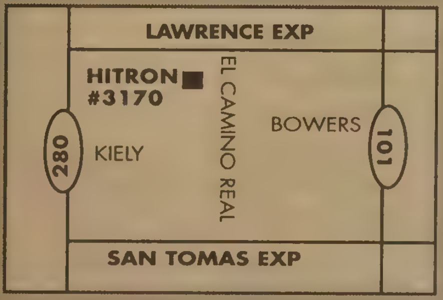

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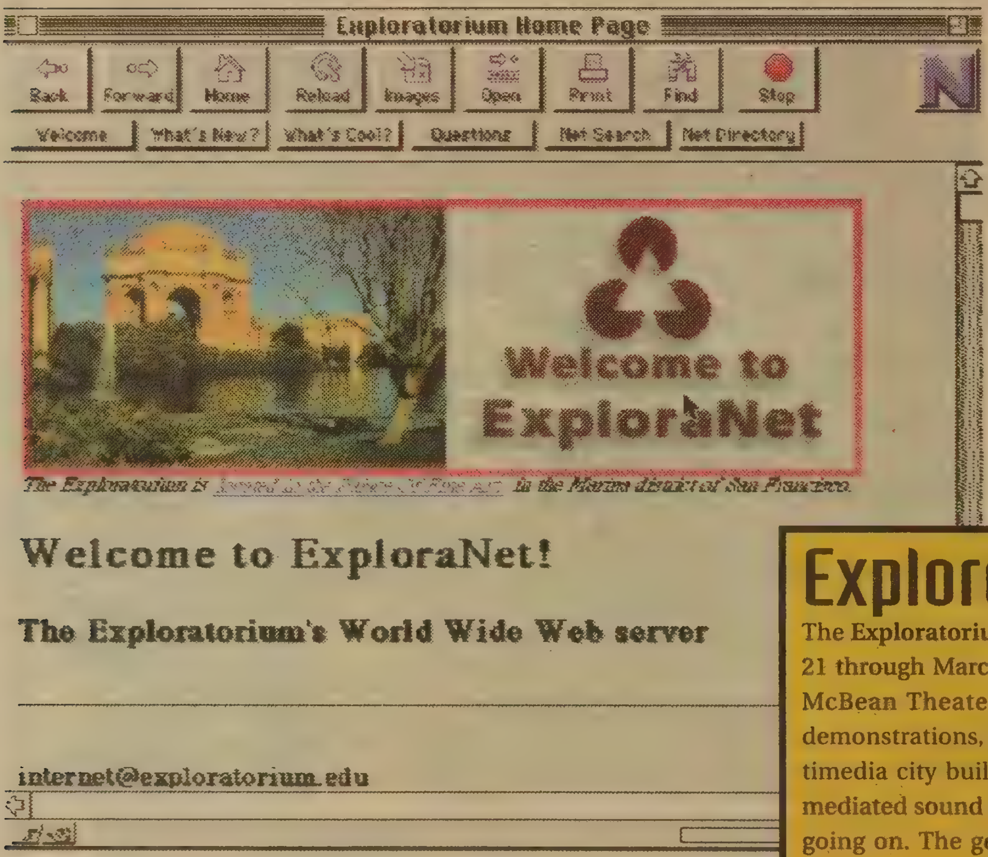
- Multimedia 101
  Meet Marc Canter
  And MediaBand 278

Gulch GOSSIP

by Jonathan E.



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Multi-Memories

Abbe Don, interface innovator and all-around multimedia marvel, is exhibiting the new version of her much acclaimed multimedia family memoirs, **We Make Memories**, at not one but two eastern museums. It opens at the National Museum of Jewish American History in Philadelphia on January 18 and at the Atlanta College of Art on January 28. She's particularly stoked about the latter because it's a group exhibition on the theme of families and she was chosen on the basis of content, not technology.

Explore This...

The **Exploratorium** presents **Multimedia Playground '95** from January 21 through March 12. The opening reception is from 2 to 5 pm in the McBean Theater on January 21. There's quite a range of exhibits, demonstrations, and discussions scheduled from a collaborative multimedia city building project by kids using the Internet to computer-mediated sound and video installations to basic explanations of what's going on. The general idea is to demonstrate what those buzzwords like virtual reality, the Internet, World Wide Web, and CD-ROM mean today and their impact on the arts. The hotline for Multimedia Playground '95 is (415)353-0423; for more general Exploratorium information, call (415)561-0360.

The **Multimedia Development Group** presented the first of its white papers, "Going Global: Multimedia Marketing & Distribution," at the Galleria on November 9. **Philippe Bouissou** of Matra Hatchette Multimedia, Paris (France, not Texas), **Hikaru Sasahara** of the Interactive Media Agency in Tokyo and Los Angeles, **Ulrich Seng** of SPEA, Munich, and **Kay Wang** of Point Asia in Taipei and San Rafael, outlined various marketing opportunities in their respective territories and how to realize them.

Not surprisingly, the markets are relatively small, but are poised to expand significantly—just like we've been promised so many times in the US. Getting into them, however, could prove tricky without careful advance work, and each territory provides different challenges.

To catch up on the details, get the white paper from the MDG, phone (415)553-2300, fax (415)553-2403, or email info@mdg.org . It isn't cheap at $125 but has a lot of names and addresses that could take a long time to gather on your own. **David Reid**, editor-in-chief of the project, announced that it took forty volunteers nine months to do the work with substantial use of the Internet. All in all it was a serious evening; **Sherry Miller** attempted to count those present with a sense of humor and found only four. I'm not sure whether she included herself.

Meanwhile, **Tim Boyle** has resigned as executive director of the MDG to become a roving ambassador, a position that sounds like a lot more fun. **Val Spangler** is currently acting executive director, but MDG is looking for someone with experience in trade association management to fill the position. MDG's future focus is to determine what the local community of developers need and to establish an on-line presence.

Sound Traffic Control presented a heavy-duty technological event in a completely different aesthetic vein—cigarette-smoking, dark-clad bohemianism—the next night at 174 King Street with

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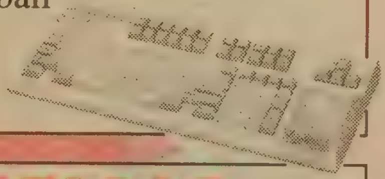

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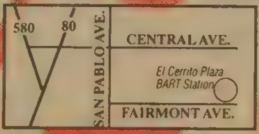

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The Throne of Drones. I've rarely seen so much gear—both the usual mixing boards and a multitude of computers processing sound in various ways. Sonically, the results were impressive—at least until the systems crashed.

Aesthetically, the consensus seemed to be that it was questionable. Having a bunch of musicians play an hour-long drone in an adjoining room with the results transmitted to televisions scattered around the main room did not enthrall many in the crowd of adventurous thrill-seekers. No one in the audience seemed to know—or care—what was going on; alienation of audience from performers is not a hot idea.

Earlier, **Perry Hoberman's Symphonic Appliance System** of PowerBook-controlled kitchen appliances was better received—it reminded me of that classic 1979 electro-punk single "Kitchen Motors" by Crash Course in Science. **Jonah Sharpe**, just back from the U K, later DJed a set of the new jungle sound—I can't say I was impressed, however trendy it is; just give me the reggae bass and leave out the high-speed techno twittering. **DJ Cheb i Sabbah**'s set of primal beats and multiple ambient layers was considerably more enjoyable. Look for DJ Cheb to be doing something interesting with **Sound Traffic Control**'s **Naut Humon** for a party at the Exploratorium during Macworld.

Don't forget to send party invites, veiled threats, shameless self-promoting hype, or boxes of bons-bons via USPS to Jonathan E., SoundSwell, 54 29th St., Richmond, CA 94804; via email to jeve@well.com ; or phone him at (510)236-8453. Note that he has a profound distaste for faxes. ■

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ET CETERA

CANDICE PACHECO'S THE VORTEX, the original soundtrack to **Hyperbole Studio**'s CD-ROM Quantum Gate II, is now out on RGB Records. This is reputed to be the first feature-length soundtrack expressly created for CD-ROM and released as standalone Red Book. The music is Pacheco's distinctive blend of electronics and African and Arabic rhythms —well worth hearing. If you like **D'Cückoo**, this'll please you. ...

Michael Brook, producer of **Nusrat Fateh Ali Khan** and **Khaled** as well as respected 4AD musical artist in his own right, is down at Interval Research doing some sort of interactive music project. Lips are sealed tight regarding details, but it was allowed that he drinks coffee. ...

Another first is the serialization of **Alexander Besher**'s novel, *Rim*, on *HotWired*. Actually, it's a series of firsts: first Web-site serialization of a novel from a major publisher; first novel for Besher, also known as the author of *The Pacific Rim Almanac*; and first novel from HarperCollins West, newest member of the HarperCollins family. The serialization will include some multimedia and hypertext elements such as audio and video interviews with Besher and some sort of glossary of characters and terminology. The question is, will *HotWired* clean up the typos? Besides that, the book is an enjoyable read and intriguing food for thought without being heavy-handed. The movie option has been bought by **Blue Wolf** as a vehicle for **Robin Williams** for release through TriStar. ...

I believe this is yet another first: an online golf tournament organized by **Sherry Huss** for *Computer Life*, using Links software through the Computer Sports Network. I don't understand golf anyway, but virtual golf??? Maybe the prizes of an IBM ThinkPad CsE color notebook and an Aptiva 350 multimedia machine explain part of its appeal.

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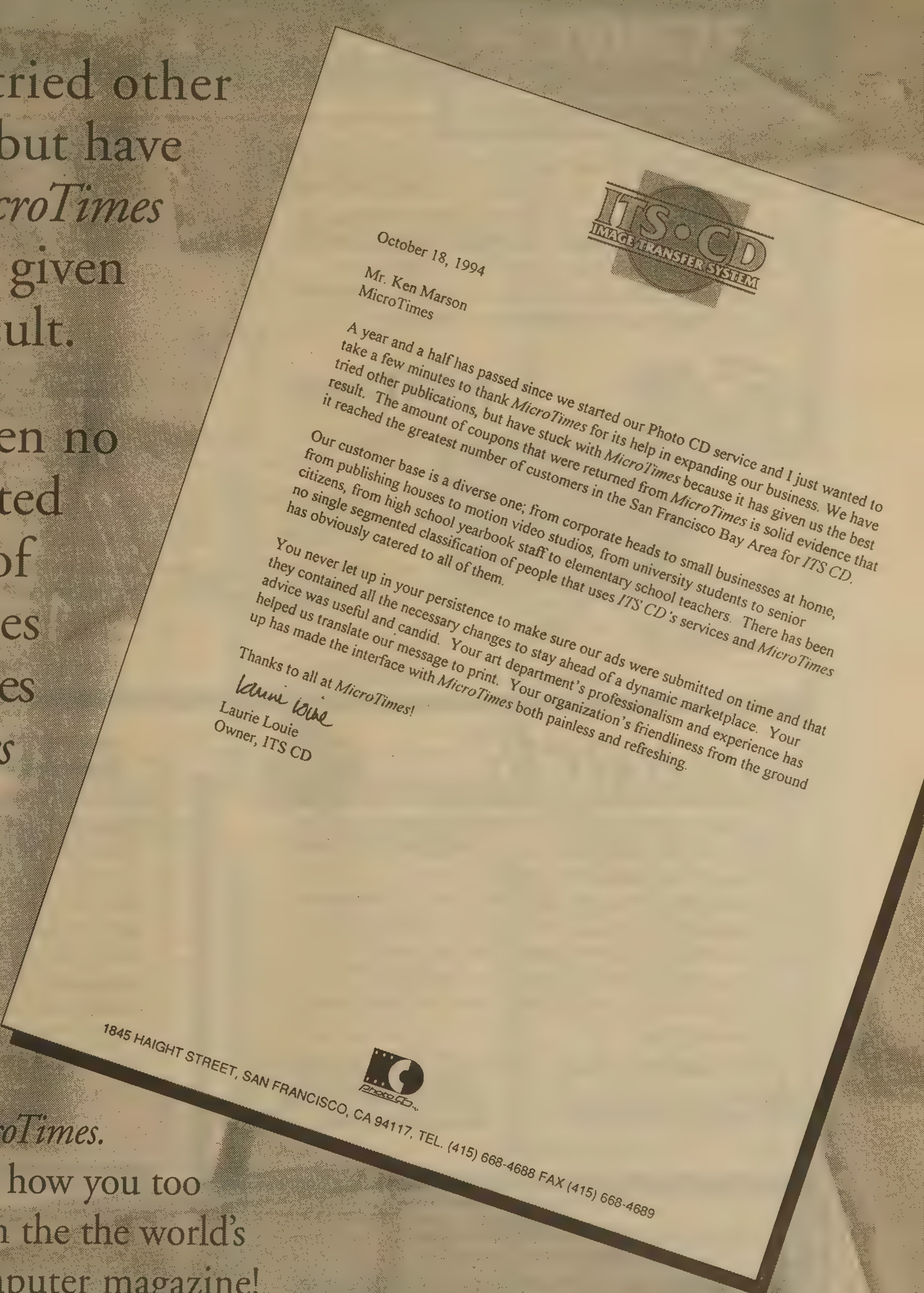

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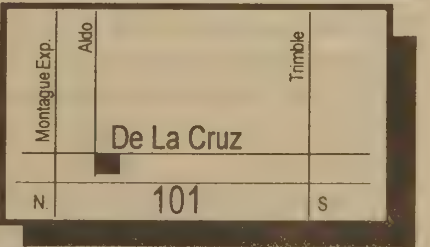

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MULTIMEDIA 101

Meet Marc Canter And MediaBand

Part 1 of 2

It's hard to believe that Marc Canter ever thought he could "retire and rest" after resigning from MacroMind (now Macromedia) in 1992. It seems like the one thing that would give him a really hard time; his large frame just about vibrates with energy and, as anyone who's seen him in action at a trade show or on a panel can testify, he's a master showman with a performer's sense of presence.

However, that's just what he claims he tried to do before starting Canter Technology, the content-producing company formed to develop more than the mere tools on which his original reputation as a multimedia maven was based.

Meet MediaBand is the first CD-ROM fruit from Canter Technology—and it's a juicy example of the varied approaches Canter and his team bring to interactive music and the video elements that make up its interface. In fact, I consider Meet MediaBand a breakthrough product that illustrates the problems in creating original interactive musical content as well as offering some solutions.

Thanks to the intense hype and frenzy over multimedia and some form of musical interactivity for the past year, leading to a natural desire to see something that fulfills all the extravagant promises, there's some danger that Meet MediaBand will be seen as some sort of destination, while it is really only the first step on a long journey. Canter himself jokes that "I've been selling beta, and people are very happy with my beta because it works. Save it as a collector's item 'cos I'll always autograph it."

More seriously, he acknowledges that MediaBand so far only scratches the surface of possibilities which, for the most part, are based on work done in the early and mid-'80s. Overall, he has a grander vision both for his own artistic endeavours and for the interactive entertainment industry as a whole.

> *Basically all you can do is to choose from among sixteen versions of the song; there's no real-time interaction.*

THE DISC

At the core of Meet MediaBand are two interactive music videos with totally different interfaces designed to suit the individual content of each song. One song, "UnDo Me," has an alternative rock feel and is the search for love of songwriter Kelley Gabriel, once known as Connie Champagne. The interactivity consists of letting you first choose which of four guys she'll go out with, then deciding at each chorus whether she'll act passively or aggressively towards them and their male ways. The mood of the music changes with each choice, and a different portion of the video runs depending on how things are going. If things are going really badly, you can undo the whole thing and try another lover.

It's a pretty simple example of the branching storyline style of interactivity, itself a simple form of interactivity, closer really to selectivity. Basically all you can do is to choose from among sixteen versions of the song; there's no real-time interaction. However, what's impressive is that the details have been thought through to produce a coherent artistic whole; each version of the song works together with its accompanying video and graphic embellishments,

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and each works in relation to the other versions.

"House Jam" is perhaps less elaborate for the user (as opposed to the programmer), but ultimately more fun. Here there's a fairly simple loop of music with all sorts of images moving about on your screen. As you click, you trigger different samples and animation sequences. "The more you click, the weirder it gets," says Canter, because after you've clicked a few times the software will trigger different effects.

Chris Watkins, aka Preacher Boy of Preacher Boy and the Natural Blues, put all the sounds together to comment on the global multicultural mishmash that some musical genres are becoming. With a little practice, it's possible to develop a fair degree of control and to be able to "perform" your own version of the material in real time. It's not multiuser yet, but it's a defining step forward in making some form of musical expression easier for nonmusicians.

I consider Meet MediaBand a breakthrough product that illustrates the problems in creating original interactive musical content as well as offering some solutions.

Around these two songs is a collection of other material, ranging from areas where you play the visual elements of the screen and sounds by rolling the mouse around, to parts of Canter's animated business plan, to early QuickTime videos of various MediaBand members, to a Smart Bar with Tony Bove as bartender where several characters pontificate on aspects of new media, to the Tekno Room where visions of the technological multimedia toys of tomorrow await you. There are also straight text documents of some of Canter's proposed schemes. The whole is a fascinating glimpse of and commentary on possible media futures.

Canter's role is essentially that of producer to the rest of the MediaBand; as both Gabriel and Watkins were quick to point out, this is a team effort and there are a total of nine MediaBand members. However, Canter and longtime associate and partner Stuart Sharpe are the guiding originators of the band.

HISTORY AND PHILOSOPHY

Talking with Canter is both an exhilarating and disjointed experience. You don't so much get to interview him as start a conversation, in much the same way as you might start an avalanche or a rockslide with a relatively minor stone's throw. You don't need to wind him up—he just goes.

I began my conversation with him by asking about the apparent irony that in 1994, the year that ambient music was "the big thing" for at least a few minutes in the conventional music business (albeit the alternative/underground side), MediaBand released a musical experience that demands one's active attention rather than staying in the background, an experience that simply doesn't work unless you consciously interact with it. I don't think he ever really answered the question, although he started to, and we returned to the subject when Sharpe appeared midway through the conversation.

Although Canter clearly follows current musical culture enthusiastically, with particular fondness for reggae and interest in new forms of dance music (such as Britain's bhangra and the new jungle style), it also just doesn't matter to him what other trends are going on. He'll certainly accept influences from whatever interests him, but he has the strength of his own artistic convictions to do whatever he feels like doing.

One of the things Canter is clearly interested in is establishing his personal history—his press kit includes his personally written three-page life story—and a good part of our conversation covered his earlier years. This may seem like the standard egotism encountered in creative types, but Canter has an obvious generosity of spirit and he's equally interested in explaining the genesis of his ideas as provided by other people. He's eager to make sure that credit due to others is given and that their place in history is noted.

It was a rather rambling and elliptical conversation, not only because of Canter's loquacity and our joint gadfly nature, but because it was also interrupted by the phone ringing, questions being asked by his assistant, people dropping by, and the return of his three boys from their morning's preschool (it also happened to be his twins' third birthday *and* Halloween); all in all it was a charming and casual morning in the home-office that Canter has set up in the old servant's room over the garage behind his house on the edge of the Richmond district of San Francisco.

Canter's answer to my question about the irony of MediaBand contrasted with ambient music began with a deconstruction of ambient but quickly lead into this analysis of his own approach:

"A lot of the way we're doing our music is that it sets this feel, this groove feel, no structure, just vamp on the tonic. In the sense of the actual context of how you're using it, we're trying to get you involved, but in fact all you're doing is 'solos,' and a lot of them are pretty wacky if I do say so myself, noise-type solos like Sonic Youth or the Breeders or whatever on top of this techno thing."

He then immediately launched into a long soliloquy about about his motivation and history: "The thing that's been driving me is my eclectic background; I believe that really it's all about eclecticism. When I was in the Chicago Children's Choir my voice changed and we could go from a doo-wop version of the Mamas and the Papas to a Stravinsky thing to a madrigal back to some Mozart, like Mozart's *Requiem*, back to a spiritual gospel—that was our repertoire and that still is my repertoire. I went from down in the electronic music studio and going up to doing Schumann. So that's my life, that's who I am and I think that's the way our society is."

I didn't even have time to disagree with him about the way our society is before he went on to discuss at length various electronic music artists that have had an effect on him, principally Brian Eno, and Vince Clarke of Depeche Mode and Erasure.

Canter's own background included studying voice and electronic music at Oberlin Conservatory of Music in the mid-'70s, followed by a period at the School of the Art Institute of Chicago studying computer graphics, video synthesis, holograms, and kinetic sculpture. He then moved to New York, where he was part of the No Wave scene of experimental music at night, and during the day built hybrid analog-digital circuits for an opthamology lab that eventually led to custom circuitry for corporate board rooms; he was operating a CMX video-editing suite, and writing the code to control laser light shows, interactive laser disks, and videotext systems. He moved back to Chicago and worked for Bally/Midway, the world's largest videogame company, as an in-house musician. After a while he realized "that special 'tools' were necessary to enable 'normal'

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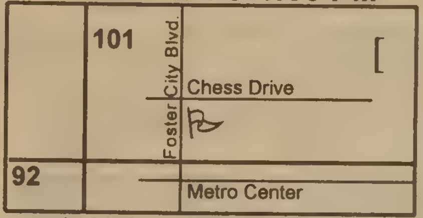

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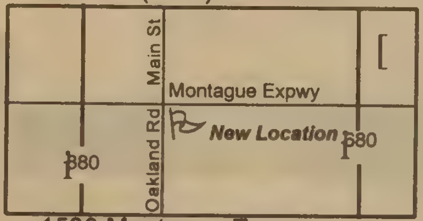

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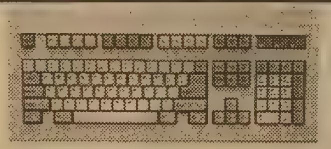

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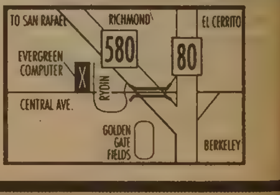

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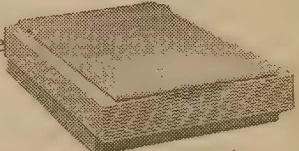

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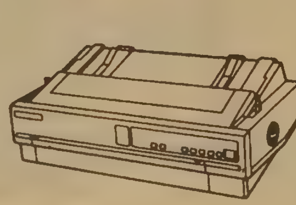

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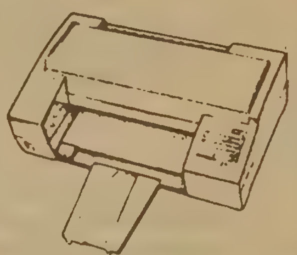

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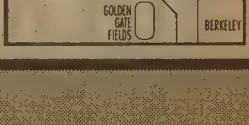

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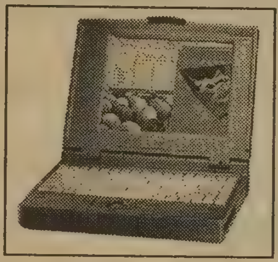
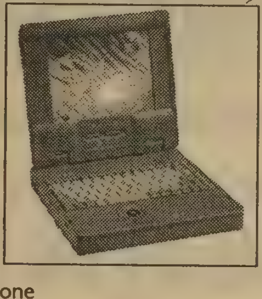


Features:
- One PCMCIA Type III or Two PCMCIA Type II Slots
- One Serial Port
- One Parallel Port
- Ultra VGA Port (1024 x768x16-Color or 800x600x256-Color)
- PS2 Keyboard/Mouse/ Keypad Port
- Internal 1.44 MB, 3.5" Floppy Disk Drive
- Internal 340MB, 2.5" Hard Disk Drive
- 85-Key Keyboard, Palmrest, and Built-in Trackball
- 2 Hour Rapid Charging System
- 100-240v Auto-Sensing AC Adapter/Charger (1lb.)
- MS-DOS and Microsoft Windows Preloaded
- One-Year, 24-Hour Acer Replacement Warranty in the USA and Canada
- One-Year Acer International Travelers Warranty
- Tool-Free 24-Hour Acer Technical Support

780cx - TFT Color, DX4-75, 8MB RAM, 340MB HDD $3795
760c - DSTN Color, DX2-50, 4MB RAM, 340MB HDD $2289

ChemBook 7500 Series Multimedia Notebook Computer



Features:
- Intel 486DX2-66 or 486DX4-100 CPU
- 128K AMI BIOS w/ Password Security
- 4MB RAM On Board, Expandable to 8/12/20/ 36MB
- 258MB, 2.5" Removable Hard Disk Drive
- 3.5", 1.44MB Floppy Disk Drive Built-in
- Built-in Speakers and Microphone
- Sound Blaster Compatible
- One PCMCIA Type III or Two PCMCIA Type II Slots
- One Serial Port
- One Parallel Port
- SVGA Port (1024x768)
- External Keyboard Connector
- Docking Station Connector
- 2 Hour N/MH Battery Pack
- 86-Key keyboard, Palmrest, and Built-in Trackball
- 2 Hour Fast Charge
- Full Range AC Adapter/Charger (1 lb.)

	DX2-66	DX4-100
Mono 64GX	$1519	$1759
Dual Scan	$1985	$2219
Active Color	$2865	$2979

ChemBook 3600 Series Pentium Multimedia Notebook Computer

Features:
- Intel Pentium CPU
- 128K AMI BIOS w/ Password Security
- 8MB RAM On Board, Expandable to 16/24/40MB
- 258MB, 2.5" Removable Hard Disk Drive
- 3.5", 1.44MB Floppy Disk Drive Built-in
- Built-in Speakers and Microphone
- Sound Blaster Compatible
- One PCMCIA Type III or Two PCMCIA Type II Slots
- One Serial Port
- One Parallel Port
- SVGA Port (1024x768)
- External Keyboard Connector
- Docking Station Connector
- 2 Hour N/MH Battery Pack
- 86-Key keyboard, Palmrest, and Built-in Trackball
- 2 Hour Fast Charge
- Full Range AC Adapter/Charger (1 lb.)

Dual Scan Color 60/66MHz $2655/2689
Active Color 60/66MHz $3575/3615

Imsi. Notebook Mouse Pen

PC Stylus C/U PS2 2Btn 1600dpi OPT-Mech. HPCo2 ....$39
PC Stylus Compet Upg. Serial DB9 2-Btn 1600dpi OPT-Mech HPC02 ....$39

QTRONIX® Notebook Keypad Scorpius 22

Ideal numerical keypad for notebook or any PC $49

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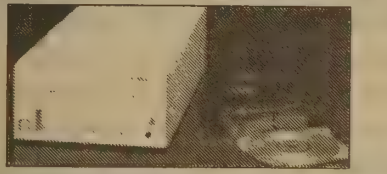

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DRM-602X
- 6-Disc Mini CD-ROM Changer
- 307KB/Sec, 300ms Access
- SCSI-II Interface $439

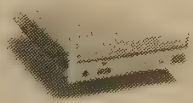
DRM-604X
- External SCSI/SCSI-2 Subsystem
- 6-CD-ROM Magazine
- Software for MAC or IBM
- 300ms/Fast 612Kb/Sec......... $959

DRM-1804X
- External SCSI/SCSI-2 Subsystem
- Up to 18-CD-ROM discs
- 3 (6-disc) magazine changer
- 300ms/Fast 614Kb/Sec.... $1879

6-CD Magazine $29

TOSHIBA 3501B

- SCSI-II Fast Quad Speed CD-ROM
- 150ms/4.2MB/Sec
- Multi-Spin/Multi-Speed
- 256K Cache Buffer
- Caddy Included



$289

External $379

TEAC
Super Quad 4X Speed
- 600KB/Sec 195ms
- AT Interface & Cable

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SONY
- CDR 55E Double Speed IDE
- 250ms/300KB/Sec

$119

BACK PACK
- External 2X Speed
- 250ms 350KB/Sec
- For Parallel Port
- Notebook Computer Compatible

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PANASONIC 562 (MATSUSHITA)
- AT Double Speed
- 320ms/320KB/SecTransfer Rate
- Photo-CD Compatible

Internal Drive $129

CHINON CD 535
- 2X-SCSI
- 256K Cache & 64K Buffer
- Photo CD Compatible

$199

Media Magic
CD-ROM INTERFACE

- Supports AT-Bus CD-ROM Drives, SONY & Panasonic
- Internal CD-ROM Audio Connector $69

Creative Labs SB

Wave Blaster $172
Sound Blaster 16 Basic Value 95
Sound Blaster 16 SCSI 2/with ASP 145/195
Sound Blaster 16 Multi CD/with ASP 135/159
Video Blaster/SE 319/235

Multimedia Specials
CREATIVE LABS DIGITAL SCHOOLHOUSE

- **Sound Blaster 16**
- **Sony CDU-33a 2X CD-ROM Drive**
- CT-38 Stereo Speakers
- 20 CD Titles Included:

Grolier's Encyclopedia, Allie's Playhouse, 3D Dinosaur Adventure, Speed, Screen Singer, Scooter's Magic Castle, Peter Pan, Eagle Eye I, Eagle Eye II, Gus Goes to Cybertown, Ensemble, Wave Studio, Sound LE, Talking Schedulers, Mosaic, Monologue for Windows

$289

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Portable Worldport 14.400 BPS Fax/Data PCMCIA 2.0 Modem

- 14.400 BPS Data and Fax
- V. 42/MNP 2-4 Error Control
- V .42 bus Data Compression Achieves Throughput up to 57,600 bps

$219

Megahertz
14.400 PCMCIA Fax Modem Includes X-Jack

- 14.4 BPS, V.42/V.42bis
- Auto Installation
- Hot Insertion
- Cellular Compatibility
- Includes XJACK, a retractable RJ11 connector that pops out to hook into a standard phone cord
- Fax Software Included

$209

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EVERGREEN COMPUTERS INT. (510) 526-8667

Resources

Calendar Of Events

Conferences, Shows, Special Events

January

January 1 Computer, Ham Radio, Electronics Swap Meet. Las Positas College, Livermore. Livermore Amateur Radio Club. Call: (510)783-2803 days, 447-3857 eves.

January 4–7 Macworld Expo. San Francisco. IDG World Expo. Call: Mitch Hall & Assoc., (617)361-2001.

January 5 MACLO '95: Macintosh In The Law Office Trade Fair. San Francisco. Vejur Technologies. Call: (408)262-7578.

January 5 Scott Adams (*Dilbert* Creator) Signing. Macworld San Francisco, Moscone Center, Booth #4140. Delrina. Call: Heather Sherman, (416)441-2778 ex. 2225.

January 5 Voyager Demonstration. San Francisco. Borders Books and Music. Call: (415)399-1633.

January 6 Life And Times Of Macintosh Book Discussion. San Francisco. Borders Books and Music. Call: (415)399-1633.

January 8 Computer Show And Sale Expo. Santa Clara County Fairgrounds, San Jose. Bonanza Show Productions. Call: Joe, (415)595-1053.

January 9–11 RSA Data Security Conference. Redwood Shores. RSA Data Security, Inc. Call: (415)595-8782.

January 11 Electronic Documents In Your Future With Robert Spinrad. Walnut Creek. ASM and DPMA. Call: Leslie Jacobsen, (408)727-3906.

January 11–12 PDA Industry Forum. San Jose. Apple, Sharp, Casio, Motorola, IBM. Call: Nola Armijo, (415)821-0191.

January 14 Computer Products Show And Sale. Scottish Rite Center, Sacramento. MarketPro. Call: (415)456-6730.

January 14 Computer Show And Sale Expo. Alameda County Fairgrounds, Pleasanton. Bonanza Show Productions. Call: Joe, (415)595-1053.

January 15 Computer Products Show And Sale. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Call: (415)456-6730.

January 15 Computer Show And Sale Expo. San Mateo Expo Center, San Mateo. Bonanza Show Productions. Call: Joe, (415)595-1053.

January 17 Merritt College Computer Information Systems Faculty Reception. Oakland. Merritt College. Call: Computer Information Systems Dep't., (510)531-4911.

January 17–19 SoftExpo95 Conference And Exhibition. San Jose. *Software Publisher* magazine. Call: ExpoMasters, 1-800-803-9488.

January 19–22 Medicine Meets Virtual Reality III Conference. San Diego. UCSD School of Medicine. Call: (619)751-8841.

January 21–22 Computer Products Show And Sale. Solano County Fairgrounds, Vallejo. MarketPro. Call: (415)456-6730.

January 21–March 12 Multimedia Playground '95. San Francisco. The Exploratorium. Call: (415)563-7337.

January 23 OS/2 Tips And Techniques Presentation By David Barnes. Menlo Park. OS/2 Bay Area User Group. Call: (510)945-7565 ex. 611.

January 28–29 Computer Products Show And Sale. Cal Expo, Sacramento. MarketPro. Call: (415)456-6730.

January 31–February 2 Display Manufacturing Technology Conference. Santa Clara. Society for Information Display. Call: Mark Goldfarb, 1-800-787-7477.

February

February 1–3 Photoshop Conference. San Francisco. Thunder Lizard Productions. Call: 1-800-221-3806 or (206)285-0305.

February 4 Computer Products Show And Sale. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Call: (415)456-6730.

CALL FOR CONTRIBUTORS

VOLUME ON COMMUNITIES IN CYBERSPACE

A volume entitled ***Communities in Cyberspace*** is being prepared for publication by the University of California Press. The editors are looking for papers that examine the subject of online interaction and community. Papers should focus on existing examples of online interaction, with particular attention to the collective organization of groups, the emergence of community, and the issues, conflicts, and problems that go along with those developments. To be considered for inclusion, prospective authors should submit a 300- to 500-word abstract and a brief biographical statement. Submissions should be sent via mail, email, or fax no later than February 1 to Peter Kollock and Marc Smith, UCLA Dept. of Sociology, 405 Hilgard Ave., Los Angeles, CA 90024-1551; email: kollock@soc.sscnet.ucla.edu or smithm@nicco.sscnet.ucla.edu; or fax: (310)206-9838.

JANUARY 21–MARCH 12

MULTIMEDIA PLAYGROUND '95

EXPLORATORIUM, SAN FRANCISCO

This multimedia event for the public combines hands-on experience with guided demonstrations in the latest developments in CD-ROM, virtual environments, the Internet, and a media workshop where you can make your own multimedia projects. The exhibition features a beginners area continuously staffed with Explainers to introduce new users to computers; experimental installations by artists in environmental settings and cutting-edge projects that provide an alternative to traditional human-to-computer interaction; public access to the Internet, featuring the World Wide Web and an opportunity to experiment with the current tools for exploring the Internet; an experimental multimedia lab and workshop; and a series of special guest presentations, discussions, films, and workshops. Admission is free for members and children under three, $8.50 for adults eighteen to sixty-four, $6.50 for university students and senior citizens, $4.50 for kids six to seventeen and people with disabilities, and $2 for children three to five. Call (415)563-7337 for more info.

JANUARY 8, 14 & 15

COMPUTER SHOW AND SALE EXPO

Bonanza Show Productions has expanded its Computer Show and Sale Expos to include the San Mateo Expo Center on January 15. In addition, there are shows at the Santa Clara County Fairgrounds in San Jose January 8 and at the Alameda County Fairgrounds in Pleasanton January 14. All of the shows feature millions of dollars of state-of-the-art computer merchandise, including CD-ROMs, software, hardware, memory chips, peripherals, and more. Admission is $5, but all display ads have a $2 coupon. Children twelve and under are free. For more info call Joe at (415)595-1053.

Rainbow Computers

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SYSTEM

	M/B + CPU	BASIC SYSTEM	BASIC SYS 210MB HD MGP CARD &14" MONO MONITOR	BASIC SYS 210MB HD SVGA CARD & 14" SVGA MONITOR	BASIC SYS 4MB RAM 210MB HD 1.2&1.44 DR SVGA CARD & 14" SVGA MONITOR	MULTIMEDIA SYSTEMS CREATIVE DISCOVERY CD 16 KIT Incl: Sound Blaster Pro 16, Panasonic CD-ROM (Dbl Spd) Speakers, CD Titles, Microphone w/BASIC SYSTEM 4MB RAM, 210MB HDD 1.2 & 1.44 DRIVE SVGA CARD & 14" SVGA MONITOR
PENTIUM 90 256C VLB PCI	$869	N/A	N/A	N/A	$1491	$1740
PENTIUM 66 256C VLB PCI	710	N/A	N/A	N/A	1341	1590
PENTIUM 60 256C VLB PCI	620	N/A	N/A	N/A	1251	1500
INTEL 486DX4-100 256C VLB	555	681	897	1034	1186	1435
INTEL 486DX2-66 128C VLB	265	391	607	744	896	1145
INTEL 486DX2-50 128C VLB	245	371	587	724	876	1125
INTEL 486DX-33 128C VLB	210	336	552	689	841	1090
INTEL 486SX-33 128C VLB	180	306	522	659	811	1060
AMD 486SDX2-80 128K VLB	300	426	642	779	931	1180
AMD 486DX2-66 128C VLB	255	381	597	734	886	1135
AMD 486DX-50 128C VLB	245	371	587	724	876	1125
AMD 486DX-40 128C VLB	235	361	577	714	866	1115
IBM 486BL-75 256C VLBw/MC	230	356	572	709	861	1110
IBM 486SLC2-66 64C VLBw/MC	175	301	517	654	806	1055
CYRIX 486DX2-66 128C VLB	245	371	587	724	876	1125
CYRIX 486DX2-50 128C VLB	200	326	542	679	831	1080
CYRIX 486DX-40 128C VLB	195	321	537	674	826	1075
CYRIX 486DX-33 128C VLB	190	316	532	669	821	1070
486DLC-40 128C W/MATH CHIP	150	276	493	630	773	1022
386DX-40 128K	89	225	442	579	731	980

UPGRADES: Please Add

486 ASUS PCI w/256 MB	$90
486 Genoa VLB 256K Motherboard	40
270MB H.D.	15
340 MB H.D.	30
420 MB H.D.	50
540 MB H.D.	85
14" .28 Monitor	25
14" .28 Non-Interlace Monitor	40
15" .28 Non-Interlace Monitor	120
VLB IDE/IO	10
Promise VLB IDE/IO w/512K	95
Orchid Kelvin VLB 1MB	99
SVGA Card VLB 1 MB	35
Spider VLB 1 MB	55
Diamond SpeedStar VLB	65
Diamond Stealth 64 VLB/PCI 1/2MB	99/149

BASIC SYSTEMS CONFIGURATION:

Motherboard & CPU,
1 MB RAM, IDE I/O of
2HD/2FD/2S/1P/1G Ports,
1.44 Floppy Drive,
Mini-Tower Case w/P.S.,
101 Keyboard

MULTIMEDIA

CREATIVE DISCOVERY CD-16 KIT

- Sound Blaster Pro 16
- Speakers
- Microphone
- CD-ROM (Double Speed)
- CD Titles

$249

CD-ROM SOUND SOUND CARDS

• Mitsumi CD-ROM (Double Speed) w/Card	$128
• Sony 55E	$119
• Toshiba 3501 4X SCSI CD-ROM	$299
• NEC 510 3XI Triple Speed	$275
• Sound Blaster 16	$79
• Sound Blaster 16 SCSI II	$119

HARD DISK DRIVES

270 MB	$155
340 MB	175
420 MB	195
540 MB	235
1.0 GB SCSI	530
2.0 GB SCSI	960

FLOPPY DRIVES

Teac 1.2 MB	$45
Teac 1.44 MB	35
Teac Dual Floppy Drive	89

DISK CONTROLLERS & I/O CARDS

IDE I/O Card w/ Cable	$13
IDE/I/O VLB Card w/Cable	18
Promise DC 420 VLB w/512K	99
Promise 4030 VL-II VLB (Exp to 16 MB)	110
Future Domain SCSI	70
Adaptec 1542 C SCSI	165
Adaptec 2842 VESA SCSI	220
Adaptec 2742 EISA SCSI	275
Adaptec 2940 PCI SCSI	210

MONITORS

14" Mono Amber	$69
14" VGA Amber	90
SVGA (1024x768) .39	175
SVGA (1024x768) .28	195
SVGA (1024x768) .28 NI	210
Impression-5 15"	290
ViewSonic-15 E15"	355
ViewSonic-15 15"	410
ViewSonic-17G 17"	745
MAG 17 17"	649
Sony 15SF 15"	420

VIDEO CARDS

Mono Graphics	$15
Trident SVGA, 512K RAM	36
Trident SVGA, 1 MB RAM	55
Trident SVGA, 1 MB RAM, VLB	65
S3 1 MB VLB	68
Orchid Kelvin 1/2MB VLB	127/177
Diamond Stealth 64 PCI/VLB 1/2 MB DRAM	129/179
Diamond Viper PCI/VLB 2 MB	255/270
Diamond Stealth 64 PCI/VLB 2/4 MB VRAM	285/430

MODEMS

Fax Modem (9600 Fax, 2400 Modem) Int	$29
Fax Modem (14400 Fax, 14400 Modem) Int	59
FaxModem (28800 Fax, 14400 Modem) Int.	120

MISCELLANEOUS

Keyboard 101, Mitsumi/Keytronic	$15/26
Mouse 3 Button	8
Microsoft Mouse	27
Logitech MouseMan	60
Logitech Trackman	72
250W Power Supply	35
Mini Tower or Desktop Case w/PS	43
Mid/Full Tower Case w/PS	63/86
Colorado Tape Back-Up 250 MB	149
Conner 250 Tape Back-Up Int	145
486 CPU Cooling Fan	7
Speakers 80 Watts	43
Speakers 100 Watts	49
Pentium CPU Cooling Fan	10
16 Bit Ethernet Card	32

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Sat: 10-4

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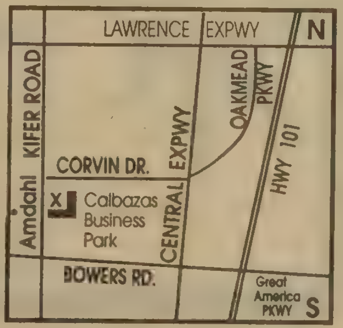

February 5 Computer, Ham Radio, Electronics Swap Meet. Las Positas College, Livermore. Livermore Amateur Radio Club. Call: (510)783-2803 days, 447-3857 eves.

February 5 Computer Products Show And Sale. Embassy Suites, San Rafael. MarketPro. Call: (415)456-6730.

February 6–9 Intermedia '95 Conference And Expo. San Francisco. Intermedia. Call: (203)840-5634.

February 12 Computer Products Show And Sale. Civic Auditorium, Stockton. MarketPro. Call: (415)456-6730.

February 12 Computer Show And Sale Expo. Santa Clara County Fairgrounds, San Jose. Bonanza Show Productions. Call: Joe, (415)595-1053.

February 13–17 Software Development '95 West Conference. San Francisco. Software Development Conference and Show Group. Call: (415)905-2784.

February 14–17 Client/Server West Conference And Expo. San Jose. CMP Trade Show & Conference Services. Call: 1-800-808-EXPO.

BONANZA SHOW PRODUCTIONS PRESENTS THE

COMPUTER SHOW AND SALE EXPO

ALAMEDA COUNTY FAIRGROUNDS
Saturday, January 14
Saturday, February 19
4501 PLEASANTON AVENUE, PLEASANTON
From the 580 take 680 South and exit East Bernal Avenue Use Gate 8.

SANTA CLARA COUNTY FAIRGROUNDS
Sunday, January 8
Saturday, February 11
344 TULLY ROAD, SAN JOSE
Take Highway 101 to San Jose. Exit on to Tully Road West.

SAN MATEO EXPO CENTER
Sunday, January 15
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February 19 Computer Products Show And Sale. Scottish Rite Center, Sacramento. MarketPro. Call: (415)456-6730.

February 25–26 Computer Products Show And Sale. Solano County Fairgrounds, Vallejo. MarketPro. Call: (415)456-6730.

February 27–March 1 High Tech Direct 2000 Conference And Expo. Santa Clara. CMP Trade Show & Conference Services. Call: 1-800-808-EXPO.

Classes, Seminars, Workshops

January

January 2 Complete Online Novell CNE Training. Berkeley. Cyber State University. Call: (510)253-TREK.

January 2 Image Vision Library Class. Mountain View. Silicon Graphics. Call: 1-800-800-4SGI.

January 3 Fox Pro 2.6 For DOS/Windows/Mac Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808 ex. 209.

January 3–5 AutoLISP Level 1 Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

January 4 Intro To Windows 3.1 Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808 ex. 209.

January 5–6 Accessing The Internet Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

January 5–6 CNE Quickpath Test Review Seminars. San Jose. Center for Advanced Professional Development. Call: (714)261-0240.

January 6 Build Your Own Complete 486 VLB (SVGA, 420HD) For Under $800 Workshop. San Rafael. Clear Communication. Call: 1-800-783-7531.

January 7 How To Build Your Own Windows For Workgroups Computer Network And Save Class. El Cerrito. Network Magicians. Call: (510)528-9895.

January 9 Complete Online Novell CNA Training. Berkeley. Cyber State University. Call: (510)253-TREK.

January 9 Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 9–10 Troubleshooting And Maintaining The IBM PC And Compatibles Seminar. Sacramento. Data-Tech Institute. Call: (201)478-5400.

January 9–10 Understanding Client/Server Computing Seminar. Sacramento. Data-Tech Institute. Call: (201)478-5400.

January 9–12 Professional AutoCAD Level 1 Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

January 9–13 Banyan Vines Advanced Administration Class. Oakland. California Computer Options. Call: (510)444-5700 ex. 188.

January 9–13 Lotus Suite Week Classes Special Offer. Oakland. California Computer Options. Call: (510)444-5700 ex. 188.

January 10 MAS 90 Accounting Software Training Class For Beginners. San Francisco. Lindquist & Lukrich Consulting. Call: (415)905-6900.

January 10 The $79 Network Solution Seminar. San Francisco. Network Services Group. Call: (415)863-8407.

January 11 Excel For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 11 PowerPoint 4.0 For Windows/Mac Level 1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808 ex. 209.

January 11 Word 6.0 For Windows Intermediate Class. San Rafael. Clear Communication. Call: 1-800-783-7531.

January 11–12 MS PowerPoint Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

January 11–13 Avid: Intro To Media Composer Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

January 12 Mosaic And The World Wide Web Seminar. Computer College Silicon Valley. Call: (415)325-3648.

January 12 Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 12–13 Negotiating Software Licensing Agreements Seminar. San Jose. Data-Tech Institute. Call: (201)478-5400.

January 12–13 Troubleshooting The Macintosh Seminar. San Jose. Data-Tech Institute. Call: (201)478-5400.

January 13 Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 14 Getting Started With UNIXware Seminar. San Francisco. Network Services Group. Call: (415)863-8407.

January 14–15 Digital Editing With QuickTime Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

January 14–15 Hands-On Video Toaster Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

January 16 Complete Online Novell CNE Training. Berkeley. Cyber State University. Call: (510)253-TREK.

January 16 Intro To IRIS Performer Programming Class. Mountain View. Silicon Graphics. Call: 1-800-800-4SGI.

January 16 QuarkXPress Class. Palo Alto. MacAcademy. Call: (415)381-7331.

January 17 Beginning Internet Class. San Francisco. Global Communications Group. Call: (415)337-5474.

January 17 Design For General Printing And Desktop Publishing Class. Oakland. Laney College. Call: Bill Leal, (510)464-3263.

January 17 Electronic Publishing Class. Oakland. Laney College. Call: Bill Leal, (510)464-3263.

January 17 Inter What? Intro To The Internet Seminar. Computer College Silicon Valley. Call: (415)325-3648.

January 17 NetWare, LANtastic, Or WFW? Seminar. San Francisco. Network Services Group. Call: (415)863-8407.

January 17 Pasteup—Traditional And Electronic Class. Oakland. Laney College. Call: (510)464-3263.

January 17 Software For The Graphic Arts Class. Oakland. Laney College. Call: Bill Leal, (510)464-3263.

January 17–18 Troubleshooting And Fine-Tuning The Networked PC Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

January 17–18 Troubleshooting And Maintaining The IBM PC And Compatibles Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

January 17–20 Novell 4.02 System Administration Class. Oakland. California Computer Options. Call: (510)444-5700 ex. 188.

January 18 Build Your Own 90MHz PCI Pentium, 512K Cache, 8MB RAM, 420HD System: $1500! Workshop. San Rafael. Clear Communication. Call: 1-800-783-7531.

January 18 Developing A Presence On The Internet Seminar. Computer College Silicon Valley. Call: (415)325-3648.

January 18 Doing Business On The Internet Seminar. Computer College Silicon Valley. Call: (415)325-3648.

January 18 Fundamental AutoCAD Designer Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

January 18 How To Build Your Own LANtastic Computer Network And Save Class. El Cerrito. Network Magicians. Call: (510)528-9895.

January 18 Internet 101: An Introduction For Beginners And The Curious Class. San Francisco. Internet Literacy Consultants. Call: (415)469-8271 or info@matisse.net .

January 18 Mac Basics Class. Palo Alto. MacAcademy. Call: (415)381-7331.

January 18 Quattro Pro 5.0 For DOS/Windows Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808 ext. 209.

January 18 WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

January 19 Joint Application Development Free Seminar. Palo Alto. GMI. Call: (415)855-9484.

January 19–20 Advanced Troubleshooting And Upgrading Techniques Seminar. Sacramento. Data-Tech Institute. Call: (201)478-5400.

January 19–20 Advanced Troubleshooting For The Macintosh Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

January 19–20 Data Communications And Networking Seminar. San Jose. Center for Advanced Professional Development. Call: (714)261-0240.

January 19–20 PC Network Resource Management Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

January 19–21 Digital Circuit PCB Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

January 20 Illustrator Class. Palo Alto. MacAcademy. Call: (415)381-7331.

January 21–22 CoSA After Effects Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

January 22 Internet 202: A How-To Class For Internet Users With Text-Based Accounts. San Francisco. Internet Literacy Consultants. Call: (415)469-8271 or info@matisse.net .

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January 23–24 Basic 3D Studio Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

January 23–27 CNE Fullpath Test Review Seminar. San Francisco. Center for Advanced Professional Development. Call: (714)261-0240.

January 24 All About Fonts Class. Palo Alto. MacAcademy. Call: (415)381-7331.

January 24 Information Retrieval On The Internet Seminar. Computer College Silicon Valley. Call: (415)325-3648.

January 24 Moving Around The Internet Seminar. Computer College Silicon Valley. Call: (415)325-3648.

January 25 A Career In Multimedia Workshop. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

January 25 FileMaker Formulas And Functions Class. Palo Alto. MacAcademy. Call: (415)381-7331.

January 25 Intermediate Internet Class. San Francisco. Global Communications Group. Call: (415)337-5474.

January 25–26 Fundamentals Of Telecommunications Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

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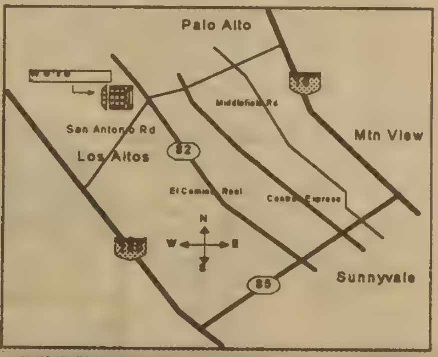

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February 8 How To Build Motivated And Productive Work-Teams Workshop. Concord. National Seminars Group. Call: 1-800-258-7246.

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continued on page 331

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- DELUXE CASE AND KEYBOARD

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212MB HARD DRIVE
SVGA SYSTEM

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- 4MB RAM
- 212MB WESTERN DIGITAL HARD DRIVE
- VIEWSONIC SVGA .28 NI MONITOR
- SVGA CARD
- 1.2 OR 1.44MB FLOPPY DRIVE
- DX4-100MHZ UPGRADABLE

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- SVGA CARD
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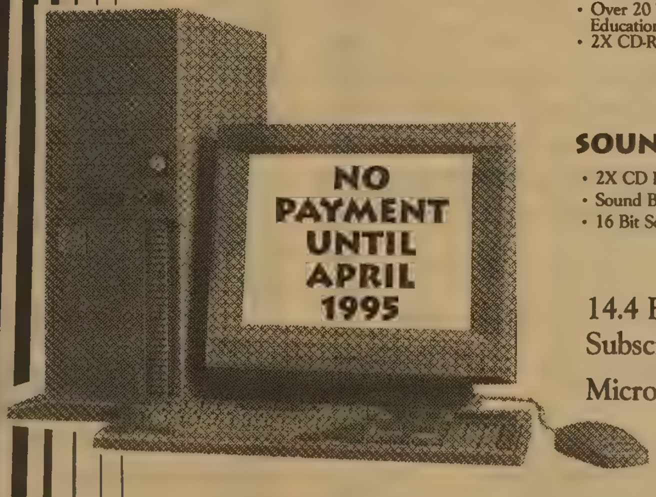

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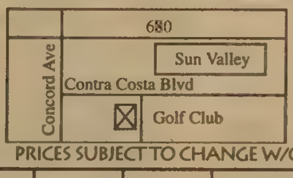

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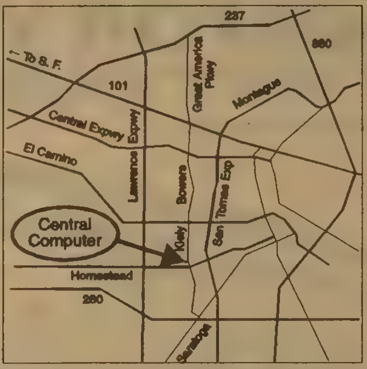

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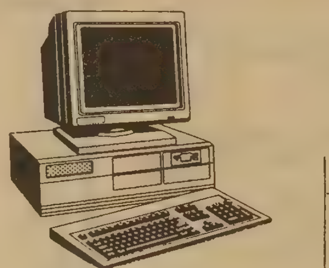
- Customer services – Norman Yip

SYSTEMS



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MS Serial Mouse
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MS Win 3.11 Workgroups

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HARDWARE

1. CD DRIVE & SOUND CARD

CREATIVE LABS	
CD 531 w. Kit Ext.	*(109)
Digital School House CD Kit Int w. 20 titles.	*(269)
Discovery CD 16 Kit Int w. 15 titles	*(239)
Edutainment CD 16 Int w. 42 titles	395
Midi Kit + Software	65
Sound Blaster Pro Value Edition	75
Sound Blaster 16 Value Edition	95
Sound Blaster 16 MCD / w. ASP	129/165
Sound Blaster 16 SCSI-2 / w. ASP	159/189
Sound Blaster AWE 32 Value Edition	239
Sound Blaster Multimedia Office Kit	499
Video Spigot for Windows	239
Video Blaster FS-200 / Wave Blaster	315/189
CHINON	
CDS-535 220ms, 300Kb/s, 2X SCSI Int	219
DIAMOND	
1000 Multimedia Kit w. 20 titles	345
4000 4 Speed Multimedia Kit w. 11 titles	419
5000 4 Speed Multimedia Kit w. 30 titles	489
Sound Card Pro-16 w. Super 10 Games	85
MEDIA VISION	
MV1100 Deluxe Multimedia Kit 2X Int	229
MV0400SE Premium Portable Ext Kit	315
MV2100 Family Deluxe Kit	279
MV3100 Super Deluxe Kit	339
MV4100 Premium Deluxe Kit	499
Premium 3D 16 SCSI-2 Sound Card	145
Pro 3D 16 SCSI-2 Sound Card	249
Pro 16 Multimedia System II SCSI	*(349)
MITSUMI	
FX400 230ms, 600Kb/s, IDE 4 Speed Int	229
NEC	
3XI 195ms, 450Kb/s, Triple Speed Int	359
3XP Plus Portable, Triple Speed	389
4XI 220ms, 600Kb/s, 4 Speed Int	379
4XE 220ms, 600Kb/s, 4 Speed Ext	489
Interface Kit w. 16 bit AT SCSI	89
PLEXTOR	
PX-43CH 220ms, 600Kb/s, 4 Speed Int	429
SANYO	
CDR-H93 280ms, 300Kb/s, 2X SCSI Int	119
SONY	
CDR-55E Double Speed IDE	139
CDR-55S Double Speed SCSI	215
TEAC	
CD55A 195ms, 4 Speed, IDE, Int w. Kit	299
TOSHIBA	
3501B 150ms, 600Kb/s, 4 Speed Int	*(299)315
TURTLE BEACH	
Monte Carlo Game Card	95
Monterey Multisound	329
Tropez Sound Card	225
OTHERS	
CD Caddy (Sony)	4.99
CD Jewel Case	0.99
CD Pop-Out Storage Case (holds 30 CDs)	19.99
Gravis Ultrasound	*(119)
Philips Multimedia 2X Kit, 325ms, 350Kb/s w. Sound Card & speakers	169
SIIG Play Computer Games On TV	149
Sounds Easy Pro 16	69
Wav Jammer 16 bit Stereo PCMCIA	275
Speakers :	
Active 75 Hi-Fi Amplier Speakers (80W)	49
Active B789 120W Speakers	65
Active SP-690 Amplied Speakers	35
Altec ACS50 / ACS150 / ACS300.1	67/105/239
EP-280 Amplified Speakers (40W)	34
Labtec CS150 Speakers	17.50

2. CASE

Antec CD Rom or 5.25" External Casing	69
Antec 3.5" HD External Casing	65
Baby AT w. 200W Power	59
Baby Tower w. 200W Power	59
Mid Tower w. 230W Power	75
Mid Tower w. Side Door Open, 230W Power	79
Mid Tower w. 250W Power : Black / White	139/129
Full Tower w. 250W Power	129
Full Tower w. 300W Power : Black / White	199/189
Pro Line Media Baby AT 250W, built-in Speakers	115
Slim w. 130W Power (2 drive bay)	75
Hard Disk Drive External Casing	
- 2 half ht or 1 full ht for PC, 60W	95
- 2 half ht or 1 full ht for Mac, 60W, w. cables	115
- 3 half ht or 1 full & half ht for PC, 60W	109
- 3 half ht or 1 full & 1 half ht for Mac, w.cables	129

3. CONTROLLER

ADAPTEC	
1515 16 bit Controller w. Kit	89
1522A Fast SCSI Board, 3Mb/s / w. Kit	85/145
1542CF SCSI Board, 10Mb/s / w. Kit	175/239
2742AT SCSI EISA w. Kit	365
2842AK SCSI VLB w. Kit	239
2940 SCSI PCI w. Kit	*(279)315
2940W Wide-SCSI PCI Kit w. wide int cable	349
APA460 Slim PCMCIA SCSI	289
ASW-EZ SCSI 3.0 for Dos & Windows	69
T348K Parallel to SCSI Adapter	139
T358K EPP Parallel to SCSI Adapter	189
BUSLOGIC	
KT445C SCSI VLB w. Kit	199
KT542B SCSI-2 w. Kit	199
KT545C Fast SCSI-2 w. Kit, 10Mb/s	209
KT747C Fast SCSI-2 EISA w. Kit	365
KT910A IDE Cache PCI w. Kit	179
KT946C SCSI PCI w. Kit (supports 8GB HD)	269
COREL	
Corel SCSI Software v2.0	89
Corel SCSI CD Power	39
DTC	
2278VL IDE w. I/O VLB, 32 bit	35
3280AS SCSI	105
FUTURE DOMAIN (SCSI)	
TMC-1660 for AT (HD only)	119
TMC-1660 SVP (SCSI Value Pack)	127
TMC-1680 for AT (4FD & HD), 15Mb/s	129
TMC-1680 SVP	139
TMC-3260 PCI / SVP	129/165
KOUWELL	
IDE only / PCI IDE Controller	24/33
IDE w. AT I/O (2S 1P 1G)	27
IDE w. AT I/O (2S 1P 1G) & 16550 & 2.88	49
IDE w. AT I/O (2S 1P 1G) VLB & 16550 chips	59
Enhanced IDE/ 4HD/ FD/ 2S 1P/ VLB	49
NEW MEDIA	
PCMCIA Bustoaster SCSI	259
PCMCIA Bustoaster SCSI-2	249
Visual Media PCMCIA SCSI	229
PROMISE (drive cache)	
DC-420 IDE VLB w. 512k, cache up to 1MB	95
DC-4030VL IDE VLB, cache up to 16MB	105
DC-2040 Bios Chips & CD Driver	15
EIDE 2300 Plus IDE/ 4HD/ 2S 1P/ 16550	69
QLOGIC	
Fast SCSI 16 bit (all SCSI CD Rom)	65
Fast SCSI EISA w. Kit	199
Fast SCSI VLB w. Kit	189
Fast SCSI PCI w. Kit	249
Wide SCSI PCI w. Kit	319
VITEX	
IDE w. I/O (2S 1P) VLB	32
IDE w. 4FD/ 2S 1P/ 16550 chips	45
IDE w. 4FD/ 4S 2P 1G/ 2S16550/ VLB	89
Enhanced IDE/ 4HD/ 2S 1P/ VLB/ 16550	65
WONDER SYSTEM	
IDE w. 4FD/ 2.88/ Drivers Tape/ 1.0 Mbps	35
IFSP2 IDE w. 4FD/ 3S 2P 1G/ 2S16550	69
SCSI w. CD Rom Drivers	39
IDE 2H4FD / 2S 1P / 16550	45
VL2018 IDE w. 2HD/ 4FD/ 16550/ 2.88/ VLB	59
OTHERS	
ACCULOGIC IDE PCI Controller	49
BOCA IDE w. I/O (2S 1P)	49
IDE w. I/O (2S 1P) / IDE w. I/O VLB	19.50/29
SC200 SCSI-2 PCI (w. NCR chips)	85

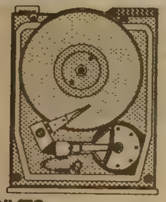
4. CPU & MATH CO

CPU :	
AMD	
386 DX-40 / 486-DX2-66	59/189
CYRIX	
486 DX-33	119
INTEL	
386 DX-33 / 40	45/45
486 DX-33 / 50	139/269
486 DX2-50 / DX2-66	179/209
486 DX4-100	539
Pentium 586-60 / 66 / 90	409/509/629
Math Co Processor :	
CYRIX	
83D87 - 33	39
IIT	
Cx486 DLC TI-40	75
INTEL	
387 DX / 387 SX (for 16/ 20/ 25/ 33 MHz)	85/79
ULSI	
83D87 - 40	39
OTHERS	
Cooling Fan for 486 CPU	7.50
Cooling Fan for Pentium 586	15

5. DIGITIZER

SUMMASKETCH	
III 12 x 12, 4 or 16 button	269
III 12 x 18, 4 or 16 button	*(495)549
VACOM	
UD-0608R 6 x 8, w. UP-201 Pressure Stylus	345
UD-1212RP 12 x 12, w. UP-201 Pres. Stylus	529
KT-0405R 4 x 5, Art Pad	155
KT-0405R with Fractal Dabler	185

6. DRIVE



FLOPPY DRIVES :	
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88MB 3.5" w. cartridge, Int	349
88MB 5.25" w. cartridge for Mac, Ext.	429
105MB 3.5" w. cart., IDE host adapter	279
105MB 3.5" w. cart., printer port for PC, Ext.	369
105MB 5.25" w. cart., SCSI for Mac, Ext.	389
200MB 5.25" w. cart., SCSI Ext	539
270MB 3.5" w. cartridge, IDE, Int	489
270MB 3.5" w. cartridge, SCSI, Ext.	539
270MB 3.5" w. cart., printer port for PC, Ext.	539
105MB Cartridge / 270MB Cartridge	59/69
EAC	
1.2MB 5.25"	46
.44MB 3.5" / w. frame	36/40
Dual - 1.2MB & 1.44MB	89
HARD DRIVES :	
ONNER	
FS-210A 213MB 14ms IDE 1" ht	155
FA-270A 270MB 14ms IDE 1" ht	159
FS-420A 420MB 14ms IDE 1" ht	185
FA-540A 540MB 12ms 256k IDE 1" ht	255
FA-540S 540MB 12ms 256k SCSI	285
FP-1060S 1.06GB 10ms 256k SCSI	559
FP-1060W 1.06GB Wide-SCSI	635
FA-1275A 1.2GB 12ms 256k IDE 1"ht.	509
FP-2120S 2.1GB 10ms 1/2 ht	1095
IGITAL	
053L 535MB 9ms 256k SCSI-2 1" ht	259
210S 2.1GB 9.5ms 1/2 ht	1049
300S 3.0GB 11.5ms full ht	1655
400S 4.0GB 11ms full ht	2215
UJITSU (5 yr. warranty fr. Fujitsu)	
2684TAU 540MB 12ms IDE 1" ht	249
2684SAU 540MB 12ms SCSI 1" ht	275
2694ESA 1.0GB 10ms SCSI-2 3.5" 1/2 ht	579
2694EQA 1.0GB 10ms Wide-SCSI	649
AXTOR	
XT-7135A 135MB 15ms IDE 3.5"	139
XT-7270A 270MB 14ms 64k IDE 3.5"	159
XT-7345S 345MB 15ms SCSI 1" ht	199
XT-7540A 540MB 14ms 64k IDE	225
XT-7546A 546MB 12ms 256k IDE	245
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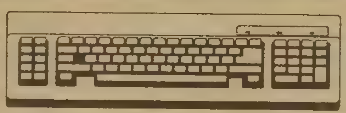
ahiti III MXO-9410000 Drive only	2175
GB Glass Cart. MXO-2015382 512k sector	165
GB Glass Cart. MXO-2015384 1024k sector	165
GB Plastic Cart. MXO-2015383 512k sector	135
GB Plastic Cart. MXO-2015385 1024k sector	135
ICROPOLIS	
C-2217A 1.75GB 10ms 512k IDE 1/2 ht	925
C-2217 1.75GB 10ms 512k SCSI-2 1/2 ht	925
C-2217AV 1.75GB Audio Visual	1045
C-2217DW 1.75GB Fast Wide-SCSI	1285
C-1926 2.1GB 13ms 512k SCSI-2 full ht	1295
C-1936 3.0GB 11ms 256k SCSI full ht	1785
C-1936AV 3.0GB Audio Visual	1885
UANTUM	
PS-270AT 270MB 12ms 128k IDE	179
PS-270S 270MB 12ms 128k SCSI	195
V-540A 540MB 14ms 128k IDE	225
V-540S 540MB 14ms 128k SCSI	249
T-540A 540MB 11ms 128k IDE	249
T-540S 540MB 11ms 128k SCSI-2	269
M-1080S 1.08GB 9.5ms SCSI-2	559
M-2100S 2.1GB SCSI-2	985
EAGATE	
T-3290A 261MB 16ms 64k IDE	155
T-3391A 341MB 12ms 256k IDE	189
T-3660 540MB 14ms 64k IDE 1"ht.	239
T-5660A 546MB 12ms 256k IDE	275
T-31200N 1.05GB 9ms 256k SCSI-2	559
T-31220A 1.08GB 12ms 256k IDE	499
T-12550N 2.14GB 8ms 1M SCSI-2	1175
T-12550W 2.14GB Fast-wide SCSI	1299
T-43400N 2.9GB 10ms 512k SCSI-2	1895
T-15230N 4.3GB 9ms 512k SCSI	1985
T-41080N 9.0GB 11.5ms 1M SCSI	3885
WESTERN DIGITAL (3 yr. warranty)	
WD-2340 340MB 12ms IDE	185
WD-2420 420MB 13ms IDE	199
WD-2540 540MB 12ms IDE	255
WD-2700 700MB 10ms IDE	319
WD-3100 1.0GB 10ms IDE	489
OTHERS	
Impression CardDrive (2 slot PCMCIA)	185
Mounting Frame for 3.5" Hard / Floppy Drive	5/5
Removable Case for 3.5" HD IDE / SCSI	39/42

7. I/O CARD

BOCA (fast chip serial)	
Bocaboard (IRQ 3,4,5,7,10,11,12,15) - 4 port / 8 port / 16 port	79/119/239
KOUWELL	
AT I/O (2S 1P) / AT I/O (2S 2P)	25/29
AT I/O (2S 1P 1G)	25
AT I/O (2S 1P 1G) w. 16550 chips	42
Printer Card	15
Serial Card (XT, AT)	15
QUICKPATH	
13 Port I/O w. 4-16550UARTs + Extd. IRQs (2IDE, 4F, 4S, 2P, 1G)	125
4 Serial, 16550UARTs, 8addr, 10IRQs (3,4,5,7,9,10,11,12,14,15)	99
SIIG (5 yr. warranty)	
(2S 1P) w. 16550 chips	45
STB 4-COM	
4 Serial, 16 bit, 16550, support Com 1-8, IRQ (2,3,4,5,10,11,12,15)	109
VITEX	
AT I/O (2S 2P) w. 16550 chips	45

8. KEYBOARD



FOCUS	
FK2001 101 Click	42
FK9000 129 Key Programmable	53
MICROSOFT	
Natural Keyboard	98
NORTHGATE OMNI	
101NI	*(65)69
102	*(65)69
Ultra T	*(89)95
SIIG (5 yr. warranty)	
Suntouch Jr. 84 Key Mini	45
Supertouch 101 Click	53
Wavetouch 101 Soft	39
OTHERS	
ANCER 101 Key (black)	42
BTC 84 Key Mini	35
Keytronic 101	35
Maxi 101 / Maxi 124	35/53
Mitsumi 101	29
Spill -resistant 101 Key	19.50

9. MEMORY

DRAM	
1MB x 1 - 80ns	6.20
256k x 4 - 80ns	5.50
SIMM	
1 x 9 - 60ns / 70ns / 80ns (1MB)	41/40/39
4 x 9 - 60ns / 70ns (4MB)	145/142
16 x 9 - 70ns (16MB)	709
256k x 9 - 70ns / 80ns	14/13
1 x 36 - 60ns / 70ns (4MB , 72 pin)	175/165
2 x 36 - 60ns / 70ns (8MB , 72 pin)	340/330
4 x 36 - 60ns / 70ns (16MB, 72 pin)	599/589
8 x 36 - 60ns (32MB, 72 pin)	1199
For Mac : 4MB x 8 - 70ns / 80ns	159/155
SIPP	
1MB x 9 - 70ns (3 chips)	42
COMPUTER MEMORY (3rd party)	
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KINGSTON MEMORY	
current price	call
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for Epson , HP, Panasonic, QMS, Texas Ins.	
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PACIFIC DATA	
for HP, Pro Tracer	
details and prices	*call Norman*

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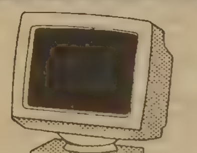
14.4 Fax Data Voice Int	*(135)155
14.4 Fax Int / Ext	*(89)/125
14.4 Pocket Fax	169
28.8 Fax 14.4 Modem Int / Ext	*(169/199)
GVC	
14.4 Fax Int / Ext	99/119
PCMCIA 9624 Fax	99
HAYES	
Accura 144 + Fax Int / Ext	*(129/149)
Accura 28.8 Fax 14.4 Modem Ext	*(259)275
ESP Communication : Single / Dual port.	85/125
Optima 144 Fax Ext	389
Optima 288B V.Fast 144 Fax Int	379
Optima 288 V.Fast 144 Fax Ext	435
PCMCIA Optima 144 Fax	*(239)285
SmartCom for Windows	*(47)
INTEL	
Faxability Plus/OCR 2.0 for Windows	*(75)
PCMCIA 144 Fax	*(199)
PCMCIA 144 International Fax	*(379)
SatisFAXtion w. Faxability Software - 400 144/144 Int / 400e 96/144 Ext	269/325
MEGAHERTZ	
PCMCIA XJ1144 144 Fax w. X-Jack	*(199)
PCMCIA XJ2144 Fax w. X-Jack	*(245)
Pocket P2144 144 Fax	245
MICROCOM	
Deskporte ES 28.8 Fast 14.4 Fax Ext	189
Deskporte EP 28.8 Fast 14.4 Fax Ext	259
Microporte 4232bis Fax	465
PRACTICAL PERIPHERALS	
Fax Me (turn HP laser to fax receiving)	*(59)
Mini Tower 144FX144 Ext	139
PM144FX144 Int	119
PCMCIA 144 Fax	279
Pocket 144 Fax	299
288 Fax 144 Ext (PC 288 LCD)	349
SHIVA	
Net modem/E Ethernet BNC/TP	1475
SMARTLINK (w. AT&T chips)	
1414BAV 144 Fax w. Software Int (w. 16550)	75
1914ATU 144 Fax Ext (upgradable to 19.2)	125
1414PAV Pocket 144 Fax	155
1914BAT 19.2/14.4 Fax Int / Ext	99/135
1414BOV-V7 144 Fax/ Voice/ Data Int	119
US ROBOTICS	
Courier v32 Terbo Fax 19.2MB w. ASL Int	359
Courier v32 Terbo Fax 19.2MB w. ASL Ext	379
Sportster 144/144 Fax MNP5 Int / Ext	99/119
Sportster 144/144 for Mac Ext	149
Sportster 28.8/14.4 Fax Int	165
Sportster V.34 28.8/14.4 Fax Int / Ext.	205/219
Worldport PCMCIA 144 Fax	195
ZOOM (7yr. Warranty fr. Zoom)	
96/96 w. WinFax Lite Int / Ext	99/125
144/144 w. WinFax Lite Int / Ext	119/145
144/144 Fax Modem & Voice Int / Ext	139/169
28.8 V.Fast 14.4 Fax Int / Ext	139/189
ZY-XEL	
U1496B 16.8 Voice 14.4 Fax w. Software Int	289
U1496B+ upgradable to 19.2Kbps Int	397
U1496E 16.8 Voice 14.4 Fax, LED Ext	299
U1496E+ upgradable to 19.2Kbps Ext	399
U1496P Portable 16.8/14.4 Fax 2 line	389
OTHERS	
CommShare 550 Phone & Fax Auto-switch	75
CommShare 750 4 Port Switching	99
National Semiconductor TyIN 2000 Int	*(75)
SIIG TeleCommunicator 10-in-1 Fax	219
14.4 Fax modem Int	59

11. MONITOR



ACER VIEW	
34T 14" 1024 x 768 .28 NI	249
56L 15" 1280 x 1024 .28 NI	359
ANTEC	
CM15GS 15" Black, 1280 x 1024 .28 NI	369
EYE Q	
SM1411 14" Flat Mono Amber Paper White	95
M447AU 14" 1024 x 768 .28 NI	249
HITACHI	
CM1586MU 15" Flat 1280 x 1024 .28 NI	389
CM1797M 17" Flat 1600 x 1280 66Hz .26 NI	975
NS1764 17" Flat 1280 x 1024 60Hz .26 NI	745
IDEK	
MF-8617 17" 1280 x 1024 .26	799
KFC	
CT1428A 14" 1024 x 768 .28 NI	249
CA1507 15" Flat 1280 x 1024 .28 NI LED.	375
CA1508 15" Flat 1280 x 1024 .28 NI LCD	389
CA1718 17" Flat 1280 x 1024 .26	745
MAG (auto switch power)	
DX15F 15" 1280 x 1024 .28 NI (no LED)	369
DX17F 17" 1280 x 1024 .26 NI (no LED)	669
MX15F 15" MPRII Flat 1280 x 1024 .28 NI	449
MX17F 17" Flat 1280 x 1024 .26 NI	849
MITAC (3 yr. warranty)	
M1564 15" 1280 x 1024 .28 NI	325
M1775 17" 1280 x 1024 .28 NI	629
NANAO	
F340iW 15" Flat 1024 x 768 .28 NI	625
F550iW 17" 1280 x 1024 .28 NI	*(879)979
F560iW 17" 1280 x 1024 .26 NI	1185
T560i 17" 1280 x 1024 .25 NI	1385
T660i 20" 1280 x 1024 .31 Trinitron NI	1965
F760iW 21" 1280 x 1024 .31 NI	1895
F780iW 21" 1600 x 1280 .26 NI	2995
NEC	
3FGe 15" 1024 x 768 .28 NI	*(495)
4FGe 15" Flat 1024 x 768 .28 NI	*(615)625
XP15 15" 1024 x 768 .28 NI	665
XE17 17" 1024 x 768 .28 NI	985
XP17 17" 1280 x 1024 .28 NI	1249
6FGp 21" 1280 x 1024 NI	1995
XP21 21" 1600 x 1200 .28 NI	2449
NOKIA	
449E 15" 1280 x 1024 .28 NI	*(435)499
447X 17" 1600 x 1280 .25 NI	1059
445X 21" 1600 x 1280 .26	2485
OPTIQUEST	
1000S 14" 1024 x 768 .28 NI	269
1500D 14" 1280 x 1024 .28 NI	349
2000DC 15" 1280 x 1024 .27 NI	399
4000DS 17" 1280 x 1024 .27 NI	725
4000TC 17" 1280 x 1024 .25 Trinitron NI	825
PANASONIC	
C1791E 17" 1280 x 1024 .28 NI	*(699)749
PROTON	
PM1561A 15" 1280 x 1024 w. speakers built-in	355
SIIG	
9" VGA Mono Paper White 640 x 480	135
SONY	
15SF 15" 1280 x 1024 .25 NI	439
17SE 17" 1600 x 1280 .25 NI w. After Dark	989
17SF 17" 1280 x 1024 .25	899
1730 17" 1024 x 768 .25 NI	849
20SE 20" 1280 x 1024 .30 NI	1835
STANDARD TECHNOLOGIES	
400-M 14" VGA Paper White	109
428-VESA 14" 1280 x 1024 .28 NI	249
VIEWSONIC	
6e 14" 1024 x 768 .28 NI	275
15 15" Flat 1280 x 1024 .28 NI	409
15ES 15" 1024 x 768 .28 NI, MacII	335
17 17" 1600 x 1280 .27 NI, MacII	849
17G 17" 1280 x 1024 .28 NI	749
20 20" 1600 x 1280 .28 NI, MacII	1479
21 21" 1600 x 1280 .26 NI, MacII	1669

12. MOTHERBOARD

AIR (w/o cpu)	
486-DX2-66 256k, 3VLB slots, built-in AT I/O	189
486-33 / DX2-66 256k, EISA, 3VLB slots	349
AMI (w/o cpu)	
Super Voyager III 486-DX2-66 VLB, 7 slots	399
Enterprise IV 486-DX2-66 256k EISA VLB	465
586-90MHz PCI 256k w. IDE I/O	499
ASUS (w/o cpu)	
486-DX2-66 256k VLB	139
486-DX2-66 256k PCI, built-in IDE+SCSI I/O	275
586-90 / 100 256k PCI EISA, dual processor	855
IBM (OPAL)	
486BL3X-75MHz VLB w. CPU & Math Proc	239
486SLC-66 VLB w. CPU & Math Proc	175
INTEL (w/o cpu)	
586-90MHz 256k PCI, built-in IDE I/O	369
LYNX (USA made, w/o cpu)	
486-33 / DX2-66 256k VLB Green PC	135
MICRONICS (w/o cpu)	
BCP 386-33 64k, 4MB max	79
486-33 / DX2-66 256k VLB	179
JX30G 486-DX2-66 256k VLB w. Zif socket	239
486 - 33 / DX2-66 256k EISA VLB	425
486-DX2-66 256k EISA E2	365
586-60 256k, ISA PCI, 3PCI slots	415
M5PE 586-60 / 66 256k EISA	595
M54PI 586-90 w. IDE I/O (Neptune)	445
NICE (w/o cpu)	
486-33 / DX2-66 256k VLB, Green PC	139
486-50 / DX2-66 256k EISA VLB	315
SHUTTLE (w/o cpu)	
486-DX2-66 256k 3VLB slots, Green PC	125
486-DX2-66 256k EISA 3VLB slots	239
SUPER P54VL-PCI (w/o cpu)	
Pentium P54VL-PCI 586-90 256k Flash Bios	349
TIGER V	
586-90MHz 256k PCI	349

price) .... special, while supplies last

13. MOUSE & JOYSTICK

AGILER

AGM-800E Serial 400 dpi	12.50
ATB-610 Serial Trackball	21.50
Master Plus 400	16.50

ANCER (black)

3-button	19

KENSINGTON

Expert Bus 4.0	119
Expert Serial & Trackball 4.0	99

LOGITECH

Cordless II	85
Cyberman 3D Controller	*(49)
First Serial	31
Fotoman Plus Camera for PC & PS/2	549
Mouseman Bus	64
Mouseman Serial	45
PG15 Bus oem	45
Trackman II	75
Trackman Portable	49

MICROSOFT (USA made)

Bus 2.0 400dpi oem / w. Bus Card	43/65
Bus 2.0 w. Expansion Card	79
Home Serial 1.0	44
PS/2 2.0 (round connector)	59
PS/2 & Serial Mouse 400dpi oem	45
Serial 2.0 400dpi oem : gray / white	29/35

MOUSE SYSTEMS

Altes Mouse	9.95
Cobra (joystick)	9.95
Mouse! Serial w. Pad	19
PC Mouse (3-button optical)	39.50
PC Trackball II	45
Serial Bus Card (9IRQs)	29
The New Mouse 400dpi (3-button)	39

JOYSTICK :

THRUSTMASTER

ACM Gamecard	29.95
F-16 FLCS	135
Flight Control System MK II	75
Flight Control System Pro	119
Flight Stand Holder	19
Formula T1 / w. Indy Car	129/149
Rudder Control	115
Weapon Control MKII	109
UPROM	29.95

OTHERS

Analog Plus (Sun Comm)	*(19.99)
Analog Pro (Advanced Gravis)	29
Dexxa Serial Mouse	19.50
PC Gamepad (Advanced Gravis)	19.95
Quickshot Smart Game Card	16.50
Star Trek Mouse Pad	7.50

14. NETWORK

3COM

3C503 Etherlink II 16 bit coax / TP	165/175
3C509 Etherlink III coax oem / reg	95/118
- 5 Pack	529
3C509 Etherlink III TP oem / reg	89/115
- 5 Pack	*(499)
3C509 Etherlink III Combo oem / reg	105/129
- 5 Pack	559
3C509 TPO oem single / 5 pack	85/449
3C529 Etherlink III for MCA coax / TP	235/239
3C579 Etherlink III EISA coax / TP	228/229
3C589 PCMCIA TP	199
3C589 PCMCIA Combo	249
3C16170 Link Builder (12TP)	359
3C16270 Link Builder (12TP + AUI)	345
3C16060 Link Builder FMSII Bridge	529
3C16670 Link Builder FMSII 12 Port	599
3C16671 Link Builder FMSII 24 Port	995
Transcend Link Builder FMS Management	350

ADDTRON

AE-200LC BNC & TP	52
AE-200JL BNC & TP	55
HUB: UTP8/L (8TP +BNC + AUI)	149
HUB: UTP16/L (16TP + BNC + AUI)	299
HUB: UTP16 (16TP+BNC+AUI) RackMount	399
Pocket Adapter BNC / TP	115/119
Transceivers: ET10TB (TP<->AUI)	37
Transceivers: ET10CB (BNC<->AUI)	37

ALLIED TELESIS (CentreCOM)

AT-1500T	*(69)
AT-1700T TP	79
Transceivers: MX10 (AUI - BNC)	39
Transceivers: 210T (AUI - TP)	39

ARTISOFT (Lantastic)

Articom	*(99)
Central Station II	399
Corstream Server 5-user	550
Corstream Server 5-user + Eagle EP3210	665
Corstream Server 10-user + Eagle EP3210	1299
Lantastic Z (2 stations)	89
Lantastic 6.0 Starter Kit coax 2-user	*(235)
Lantastic 6.0 Add On NR-SI 2000C	*(115)
Lantastic 6.0 Add On NR-SI 2000T	125
Lantastic 6.0 Software single user	79
- 6.0 for 5-user / 10-user	339/599
- upgrade for single	39
- upgrade for 5-user	*(99)129
Lantastic for OS/2	99
Lantastic for TCP/IP single / 5-user	199/785
NR2000C BNC only (Lantastic 5.0)	167
NR2000T RJ45 only (Lantastic 5.0)	169
NR-SI 2000C coax / 5 pk / 10 pk	79/375/685
NR-SI 2000T TP / 5 pk / 10 pk	84/379/689
NR-SI 2000A Combo	115
NR-SI 2000M for MCA	139
Remote Boot ROM for NR2000	45
Eagle Ethernet Cards :	
- Eagle EP2000 coax / TP	89/85
- Eagle EP3210 coax / TP	165/159
- Eagle NE200 PCMCIA coax / TP	199/235
- Eagle NE2000 Plus Ethernet coax / TP	92/89
- Eagle NE3200 EISA coax w. TPA (FS)	465
- Eagle NE3210 EISA 32 bit Combo	199
- HUB: 8 Port TP (8TP + 1BNC)	*(209)225
- HUB: 12 Port TP (12TP + 1BNC)	355

ASANTE (for Mac & PC)

AH1012 Intelligent HUB 12 Port	875
10T HUB 8 Port	199
10T HUB 12 Port (12TP + 1BNC + 1AUI)	495
FriendlyNet with AUI / BNC /TP	69

BOCA

HUB: 8 Port TP only	149
HUB: 16 Port TP only	269
LAN Card : ISA TP / ISA Combo	59/69
LAN Card VLB TP	75
PCI 32 bit Ethernet Combo	89
PCMCIA 10BT Ethernet	169

CASTELLE

JetPress (network Print server) for HP II. IID, III, IIID, coax + TP	429
LANPress (print server connects up to 4 printers)	
- Ethernet Thick/Thin coax (1P 3S)	475
- Ethernet 10BaseT (1P 3S)	475
- Ethernet BNC & 10BaseT (2S 2P)	435

CeLAN

Flex HUB Ethernet SNMP	call
Repeater : coax 2 port	225

COGENT

EM525 Ethernet 16 coax / TP	118/119
EM525 Ethernet 16 Combo	135
EM595TP Ethernet PCMCIA UTP	199
EM932 EISA 32 bit coax / TP	238/239
EM960 32 PCI Full Duplex TP / Combo	135/159
EM964TP 32 PCI 4-Port Full Duplex TP	495

DCA

Crosstalk 2.1 for Windows	109
Communicator	58
IRMA Workstation 2.1 Dos / for Win	259/359
IRMA 3270 for MacII/ LC/ SE	735

DIGIBOARD

network products	call

FARALLON

PN381 PhoneNet w. Timbuktu for Win	259

IBM

Ether 16 coax / TP	69/69
Ether 16 Combo	79
PCMCIA 10B2	255
PCMCIA 10BT	235

INTEL

EtherExpress 16 Flash Combo / 5 pk	135/625
EtherExpress 32 EISA coax (FS)	439
EtherExpress 32 Flash EISA Combo (WS)	229
EtherExpress Pro 8/16 bit cards :	
- PCLA 8200 BNC + AUI + TP	129
- PCLA 8200 5 pack	559
- PCLA 8210 BNC + TP / 5 pk	115/499
- PCLA 8220 TP / 5 pk	109/469
- PCLA 8205 Flash BNC+AUI+TP	139
- PCLA 8205 5 pack	599
- PCLA 8215 Flash BNC + TP / 5 pk	125/549
- PCLA 8225 Flash TP / 5 pk	119/509
HUB: 12 Port EtherExpress ISA	565
HUB: 12 Port EtherExpress EISA	645
LAN Project 1.5 (virus protection)	685
LAN Sight Support 4.0	345
LAN Spool s/w 386 NLM v3.5A	425
Netport II Thin & Thick	395
Netport II 10BT	399
Netport Express XL	465
NetSatisfaxtion 2.5 for Novell	955

LANPRO

2000JC 16 bit BNC only	39
2000JT 16 bit TP	*(29)39
2000JA 16 bit Combo	45
Dos 7 + 2000JC	75
EP3010A Pocket Combo	115
HUB ER5390: 8 Port (9TP + 1BNC)	155
HUB ER5396: 16 Port (17TP + 2BNC)	295
Lan Card : PCI Combo / VLB	95/85
Personal Netware coax 1 user Kit	79
Personal Netware coax Starter Kit	139

NATIONAL SEMICONDUCTOR

InfoMover NE2000+ coax	*(75)85
InfoMover NE2000+ 5 pack	*(365)399
InfoMover NE2000+ TP	*(69)79
InfoMover NE2000+ 5 pack TP	*(335)355
InfoMover NE2000+ Combo	*(89)99
InfoMover NE2000+ 5 pack COMBO	*(435)475
InfoMover NE4100 PCMCIA coax	175
InfoMover NE4100 PCMCIA TP	179

NOVELL

Dos 7 (w. Personal Netware) oem / reg.	45/55
Lan Workplace 4.2 single / 10-user	275/1295
Microdyne NE2000+ coax / 5 pack	*(75/349)
Microdyne NE2000+ TP / 5 pack	*(69/319)
Microdyne NE2000+ Combo / 5 pack	*(85/389)
Microdyne NE3200 EISA coax / TP	450/450
Netware 3.12 *(call for oem discounted price)*	
- 5 / 10 / 25-user	615/1395/2085
- 50 / 100 / 250-user	2695/3995/6995
Netware 4.02	
- 5 / 10 / 25-user	825/1795/2625
- 50 / 100 / 250-user	3595/5495/9695
Netware Management Agents	335
Netware NFS v1.2C	3150
NFS Client for Lan Workplace	205
Personal Netware oem / reg	39/75
Personal Netware 5-user	265
Unixware Personal Edition - CD version	175
Unixware SDK v1.1 - CD version	75
Unixware NFS	135

SMC (Western Digital)

8003 Plus Elite 8 bit coax / TP	99/99
8013 Plus Elite 16 coax / 6 pk	118/625
8013 Plus Elite 16 TP / 6 pack	119/599
8013 Plus Elite 16 Combo / 6 pack	139/775
8013 Plus/A for MCA / for TP	*(175)/199
8 Port Concentrator (8TP + 1AUI)	335
12 Port Concentrator (12TP+2AUI+1BNC)	595
Elite Ultra 16 coax oem / reg	85/109
- 6 pack	*(489)535
Elite Ultra 16 TP oem / reg	79/108
- 6 pack	*(455)495
Elite Ultra 16 Combo oem / reg	95/119
- 6 pack	*(549)585
Elite Ultra 32 EISA Combo	215
Etherpower PCI : TP / Combo	185/199
Netware Boot ROM for Ethernet	34
Tiger HUB: 3206TA 6 Port	199

SYNOPTICS

Network Products	call

XIRCOM

PCMCIA CE-10B2 coax	*(235)
PCMCIA CE-10BT TP	*(229)
PCMCIA CE-10BC Combo	*(275)
PE3-10B2 Pocket Adapter coax	*(255)285
PE3-10BT Pocket Adapter TP	*(259)289
PE-3 10BC Pocket Adapter Combo	*(295)325
PEM-10BT w. Modem	*(299)

OTHERS

CD Link Access for Novell Netware	
- 5-user / 10-user / 25-user	79/159/225
CABLES & ACCESSORIES :	
10BaseT, Level 3 plenum 1000'	165
Crimping Tools	call
Belden 8259, RG58 1000'	165
RG58 U 500' / 1000'	59/99
RG58 A/U 500' / 1000'	75/129
Twisted Pair 2-pair, PVC, Level 3	
- 500' / 1000'	45/59
Twisted Pair 4-pair, PVC, Level 3	
- 200' / 500' / 1000'	35/55/89
Twisted Pair 4-pair, PVC, Level 5	135

15. NOTEBOOK

TOSHIBA

T1960CS 486-DX2-50, 4MB RAM, 200MB HD, 1.44BM FD, Dual Scan Color	2275
T1960CT 486-DX2-50, 4MB RAM, 200MB HD, 1.44MB FD, Active Color	2795
T1960CT 486-DX2-50, 4MB RAM, 320MB HD, 1.44MB FD, Active Color	3029
T3600CT 486-DX2-50 8MB RAM, 250MB HD, 1.44MB FD, Acitve Color	3699
T4700CT 486-DX2-50, 8MB RAM, 200MB HD, 1.44MB FD, Active Color	4399
T4700CT 486-DX2-50, 8MB RAM, 320MB HD, 1.44MB FD, Active Color	4629

OTHERS

3600 Pentium 586-60 / 66, 16k cache, 8MB RAM, 250MB HD, 1.44MB FD :	
- w. Active Color 60Mhz	3495
- w. Active Color 66MHz	3675
- w. Dual Scan Color 60Mhz	2725
- w. Dual Scan Color 66Mhz	2895
- VLB Docking Station	475
ACC9400 9.5/10.4" Viewable Screen size, 128k, 4MB (expandable to 36), VLB w.1MB video ram, removable HD, built-in speaker & microphone :	
- 486-33, 250MB(DSTN)	1995
- 486-33, 250MB (TFT)	2969
- 486-DX2-66, 250MB (DSTN)	2025
- 486-DX2-66, 250MB (TFT)	2999
- 486-DX4-100, 250MB (DSTN)	2395
- 486-DX4-100, 250MB (TFT)	3359

16. POWER SUPPLY

AMERICAN POWER CONVERSION

APC-400 Smart-UPS (286, 386 WS)	289
APC-600 Smart-UPS (386, 486 FS)	359
APC-900 Smart-UPS (386, 486, FS & WS)	515
APC-1250 Smart-UPS (multiple FS & WS)	639
APC-2000-2 2 Smart-UPS	1150
APC-400 Back-UPS (300W)	175
APC-450 Back-UPS (325W)	209
APC-600 Back-UPS (425W)	285
APC-900 Back-UPS (650W)	375
APC PowerChute Plus :	
- for Novell	65
- for OS/2, Lan Server, 3 Com	75
- for Unix / Xenix	99
- for Windows NT	69
Power Doctor (DOS) I/F Kit for Smart-UPS	79
Surge Arrest Unit	call

PC POWER COOLING

Standard 220	
- for Desktop / Full Tower	85/85
Silencer 270	
- for Slim (baby or mid tower)	135
- for AT Desktop	165
- for Full Tower	159
Turbo Cool 300	
- for Slim (baby or mid tower)	139
- for Desktop.	175
- for Full Tower	169
Turbo Cool 450	
- for Desktop	325
- for Full Tower	315
Twinpower 900 (redundant)	925

TRIPP LITE

Isobar 4	*(29.95)
Isobar 6 w. Fax Modem Protection	*(45)
Isobar Console CC16 Plus w. RJ11	75
Isotel 4 w. RJ11	*(39.95)

OTHERS

250W for Baby AT	45
250W for Baby or Mid Tower	45
250W for AT / for Full Tower	47/49
300W for Full Tower	69
550W for UPS	279
1200W for UPS	659

17. PRINTER

BROTHER

HJ-400 Desktop Ink Jet for PC or Mac	*(249)259

CANON

BJ-200E Ink Jet	229
BJC-600 Ink Jet Par. 360dpi	535

CITIZEN

GSX-145 24 pin, 132 column	355
GSX-220 24 pin	179
GSX-230 Fonts & Quiet	219
GSX-240 Scalable Fonts & Quiet	285
Projet II Ink Jet	279
Accessories :	
- Color Option for GSX-130	45
- Color Option for GSX-145	65

DEC (Digital Equipment)

Printers	cal

EPSON

Stylus Color Inkjet 720dpi	*(549

HP (Hewlett Packard w. toner)

Color Laser Jet	5495
Desk Jet 540	289
Desk Jet 560C	*(489)529
Desk Jet 1200C PC, Mac	*(1329)1379
Desk Jet 1200C Postscript PC, Mac	*(1895)1995
Laser Jet 4+ / 4M+	1389/1899
Laser Jet 4L / 4ML	619/985
Laser Jet 4P / 4MP	939/1355
Laser Jet 4Si / 4SiMX	2875/4095
Laser Jet 4V / 4MV	1895/2749
Accessories :	
- Color Kit for 540	49
- Duplex C2061A for 4Si or 4SiMX	495
- Envelope Power Feeder 75 Sheet (HP4)	279
- J2550A Jet Direct TP	329

(price) .... special, while supplies last

- J2552A Jet Direct Combo	395
- Legal, Letter or A4 250 Sheet Tray (HP4)	99
- Legal, Letter or A4 500 Sheet Tray (HP4)	109
- Lower Cassette w. Letter Tray (IIP, IIIP)	149
- Optional 500 Sheet legal Letter A4 (HP4)	279
- Postscript for LJ4	329
- Postscript C2013A for 4Si	575
- Toner for II, III	84
- Toner for IIP, IIP+, IIIP	76
- Toner for 4	109
- Toner for 4L or 4P	69
- Toner for 4Si	135

LASER MASTER

Win Printer 800 Postscript	1075
Win Printer XL600 11x17, 600x660ppi	2350
Winjet 1200 (postscript for HP4)	*(650)
Winjet 1200+ (postscript for HP4+)	*(675)775

MICROTEK

TrueLaser MTP-306 35 fonts, 6ppm, 2MB	*(795)

NEC

Super Script 610 Laser 6ppm, 300ppi	499

OKIDATA

ML184T 9 pin, Par	229
ML320 9 pin, Epson compatible	325
ML380 24 pin, Epson compatible	235
ML590 24-wire	429
OL400E Laser / after rebate	515/440
OL410E Laser 4ppm, 600ppi	*(645)
OL410E/PS Laser Postscript	895

PACIFIC DATA

ProTracer II Ink Jet (CAD Plotter) a4 to A2 size, 360dpi, I960RISC, 512k, 45dBA	979
ProTracer II-GL2 w. HP-GL2 & 2MB	1369

Accessories :

- HP-GAL Emulation Card	375
- Ink Cartridges	19.50
- Postscript Emulation Card	375
- Sheet Feeder I / II	135/115

PANASONIC

1150 9 pin, 55dBA	139
1624 24 pin	379
2023 24 pin, Quiet	185
2123 24 pin, 43.5dBA, Color capability	239
2130 Quiet dot matrix (after rebate 169)	199
2135 Quiet dot matrix Color (after rebate205)	255
3123 Scalable Fonts , 24 pin, Quiet	259
3124 Scalable Fonts , 24 pin , LCD	329
3624 24 pin, 46.5dBA, Quiet	399
J250 Ink Jet , 300dpi, 128 nozzle printhead	*(259)
4410 Laser 5ppm, 512k	479
4430 Laser 5ppm, 1MB	665
4400 Led Page (after rebate 399)	449
4440 Laser 10ppm	995
4455 Postscript 11ppm	1695
5400 Led Postscript 4ppm (after rebate 499)	599
SP-100 Multi-function printer	799

Accessories for 4410, 4420, 4430. 4400 4440, 4450 4450I, 4455, 5400 available for details and prices .... call Norman

Other Accessories :

- 32k Buffer Dot Matrix KX-P43	65
- Auto Sheet Feeder for 1124 KX-P36	120
- Color Upgrade Kit KX-PCK11	55
- Serial Interface Card PS-13	75
- Single Bin Cut Sheet Feeder KX-PT10	95

SEIKO

Smart Label Printer Plus	*(129)
Smart Label Printer Pro	245
- Standard Label (2 rolls)	7.95

SUMMAGRAPHICS (Plotter)

DMP-60 A to D Size	1275
DMP-61 A to D Size	1275
DMP-161 A to D size	1599
DMP-162 A to E size pen	1899
Hiplot 7100 A to D w. stand	1999
Hiplot 7200 A to E w. stand	2355

TEXAS INSTRUMENTS

Printers	call

LASER PRINTER ACCESSORIES

PACIFIC DATA

25 in One! for HP DJ500	99
25 in One! for HP II, IID, IIP, IIP+, III, 4Si	245
Complete Font Library for HP III, IIID, IIIP	255
Font Bank for all HP Lasers (stores soft fonts) 0.75MB / 1.5MB	205/269

Pacific Connect XI :
for HP II, IID, III, IIID -

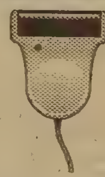
- 5 Port 256k / 1MB (4S 1P)	309/379
- 10 Port 256k / 1MB (10S)	449/519

for HP 4, IIISi, Paint Jet XL300 -

- 7 Port 1MB / 4MB (6S 1P)	449/649
- 10 Port 1MB / 4MB (10S)	519/179
Pacific DirectNet for Novell	369
Pacific DirectNet for Novell, Unix & Ethertalk	299
Pacific DirectNetEX for Novell & TCP/IP	469
Pacific 4, Postscript for HP 4	259
Pacific Page 2MB, Postscript for HP II	365
Pacific Page II/XL 4MB, Postscript for HP II	699
Pacific Page PE for HP IID,IIP,IIP+,III,IIID,IIIP	279
Pacific Page PE 2MB	385
Postscript 4MB PE/XL for HP III	699

Plotter in a Cartridge for HP II	225
Plotter in a Cartridge PE for HP IID, IIP, IIP+, III, IIID, IIIP	225

18. SCANNER



AVISION (flatbed color)

Superior 24 bit, Color/ 256 Gray/ SCSI interface

- AV600 / AV680 w. Lphoto Plus	509/649
- AV660 / AV680 w. Photoshop 2.5	725/845

HP (flatbed)

ScanJet IICX Color w. Kit	925
- Auto Document Feeder	475
ScanJet IIIP Gray Scale w. Kit	489

INFO

SF3GS Gray Scale 300 dpi w. OCR	265
SF6CP Color 600 dpi w. OCR	415

LOGITECH (hand)

Scanman Easy Touch w. OCR	169
Scanman 256 / w. Omni Page OCR	135/155
Scanman Color w. Omni Page OCR	255
Scanman Power Page	399

MICROTEK (flatbed color)

Scan Maker II w. Photoshop L.E.	565
Scan Maker IISPX 300 x 600 dpi	899
Scan Maker III	2495

TAMARACK (flatbed color)

ArtiScan 24 bit, Color / 256 Gray Levels / SCSI-interface / for PC or Mac

- w. Photoshop. & OCR 600 / 800 / 1200 dpi	485/585/855
- w. Photostyler 600 / 800 / 1200 dpi	655/755/1025
- w. Photoshop 2.5 600 / 800 / 1200 dpi	655/755/1025
Slide Scan Kit (transparency, slide, X-ray) 600 / 800 / 1200 dpi	525/525/595

OTHERS

Fax Scanner (turn fax into scanner)	*(29)

19. TAPE BACKUP

COLORADO

DJ-20 250MB QIC-80	155
- 3M DC2120 Tape / Pre-Formated	10.99/12.99
- AB-11 External Tape Port	35
- Cable (2FD & tape backup)	6
- FC-20 Controller	69
- KE-09 External Kit w/o Controller	59
- TC-15 Controller w. Data Compression	155
- Unix / Xenix Driver	99
DJ-35C 340MB Int	189
PT-10 PowerTape 1GB SCSI Int	599
PT-25 PowerTape 2GB 300Kb/s Int	965
PTE-25 PowerTape 2GB Ext	1095
PT-50 PowerTape 4GB 300Kb/s Int	1525
PTE-50 PowerTape 4GB Ext	1655
Tracker 250MB / 350MB (printer port)	285/325

CONNER

CNR-2150S 250MB Int	325
CNR-250MQPT 250MB Ext	315
CNR-2525S 525MB Int	469
CNR-4320RT 2GB Int	745
CNR-4350XT 2GB Ext	985
CNR-4324RP 4GB Int	849
CNR-4354XP 4GB Ext	1145
Tape Stor 250MB w. 3M Cartridge	139

EXABYTE

EXB-2501 750MB - 1.5GB SCSI-2 Int	499
EXB-2501 750MB - 1.5GB SCSI-2 Ext	649
EXB-4200 4mm Dat. 2GB Int	799
EXB-4200 4mm Dat. 2GB Ext	975
EXB-8205 8mm Dat. 2.5 - 5GB Int	1345
EXB-8205 8mm Dat. 2.5 - 5GB Ext	1595
EXB-8505 8mm Dat. 5 - 10GB Int	2035
EXB-8505 8mm Dat. 5 - 10GB Ext	2285
FS1G (2501 + Control Kit) Int / Ext	675/835

HEWLETT PACKARD

35470 4mm Dat. 2-4GB SCSI Int	789
35480 4mm Dat. 4-8GB SCSI Int	885
C1533 4mm Dat. 8-16GB SCSI Int	1059

OTHERS

Sytos Plus Backup s/w for Dos / Win	99/95
Tape Cartridges : 3M, Exabyte, HP, Maxell, Sony	call

20. VGA CARD

ATI

Graphics Ultra Plus 2 DRAM w. mouse	199
Graphics Ultra Pro 2 ISA w. mouse	265
Graphics Ultra Pro 2 VRAM VLB	265
Graphics Ultra Pro 2 EISA	325
Graphics Ultra Pro 2 PCI oem / reg	289/315
Graphics Pro Turbo 2MB PCI / VLB	379/379
Graphics Pro Turbo 4MB PCI / VLB	589/589
Graphics Wonder 1MB ISA	135
Graphics Wonder 1MB VLB	139

DIAMOND

Stealth 32 2MB PCI	199
Stealth 64 2MB DRAM PCI / VLB	209/209
Stealth 64 2MB VRAM PCI / VLB	339/339
Stealth 64 4MB VRAM PCI	469
Stealth 64 4MB VRAM VLB	469
Stealth Pro VRAM 1MB VLB	235
Stealth Pro VRAM 2MB VLB	315
Viper P9000 VRAM 2MB VLB	325
Viper SE VRAM 2MB PCI oem / reg	299/379
Viper Pro VRAM 2MB PCI	399
Viper Pro VRAM 2MB VLB	399

MATROX

IMP/3AH 1600 x 1200, 3MB ISA	699
IMP/3VH 1600 x 1200, 3MB VLB	699
IMPRO Plus 1600 x 1200, 2MB PCI	415
VLB/2 Plus 1600 x 1200, 2MB VLB reg.	425
VLB/2 Plus 1600 x 1200, 2MB VLB oem	345
PCI/2 1600 x 1200, 2MB PCI	399
PRO/4.5ZV 1600 x 1200, 8MB VLB	1359
Upgrade/2 2MB Memory	215

MEDIA VISION

ProGraphics 1024 VL 256 Color 1MB	*(199)239
ProGraphics 1024 VL 16m Color 2MB	*(285)339
ProGraphics 1280 4MB	675

NUMBER NINE

T134020, 1280 x 1024, 90Hz, S3-928 chip

- GXe Level 10 VRAM 1MB ISA	259
- GXe Level 11 VRAM 2MB ISA / VLB	335/339
- GXe Level 12 VRAM 3MB ISA / VLB	395/405
- GXe Level 14 VRAM 4MB ISA / VLB	599/599
GXe-64 DRAM 1MB PCI/ VLB	195/195
GXe-64 DRAM 2MB PCI / VLB	249/249
GXe-64 Pro VRAM 2MB PCI	349
GXe-64 Pro VRAM 2MB VLB	349
GXe-64 Pro VRAM 4MB PCI	529
GXe-64 Pro VRAM 4MB VLB	529

ORCHID

Fahrenheit 64 1MB PCI / VLB	159/159
Kelvin 64 Windows Accel. 1MB PCI / ISA	145
Kelvin 64 Windows Accelerator 1MB VLB	145
Kelvin 64 Windows Accelerator 2MB PCI	189
Kelvin 64 Windows Accelerator 2MB VLB	189

SPIDER

Spider 64 1MB VLB / PCI	135/135
Spider 64 2MB VLB / PCI	185/185
Spider 64 4MB VLB / PCI	285/285
Tarantula 2MB VLB / PCI w. free T-shirt	279/279
Tarantula 4MB VLB / PCI w. free T-shirt	389/389

OTHERS

Cirrus Logic CI5428 1MB	99
Cirrus Logic CI5428 2MB VLB	145
Cirrus Logic GD5434 64 bit 2MB PCI	169
ET4000 Tseng Lab 1MB ISA	79
ET4000 1MB VLB	109
ET4000 W32p 2MB VLB	179
ET4000 W32p 2MB PCI	179
MGP Card (monographic w. printer port)	29
Intel Smart Video Recorder	*(369)
Intel Smart Video Recorder Pro	439
Oak077 Super VGA 512k	52
Oak087 Super VGA 1MB	65
Paradise Window Accel 24 bit VGA	*(99)129
Video Plus (video image grabber)	185
V-Mate Pro (flicker free ext. video encorder)	189
WinVision (video capture)	165
S3 Vision 864 64 bit 2MB PCI	179

SOFTWARE

1. CD SOFTWARE

Call for Wholesale Prices

$5.99 Each

- Business Assistant
- Clip Media 2.0
- Club Kid Soft
- Jokes and Pranks
- Introduction PC & Dos
- Lazer Tax
- Mayo Clinic: Sampler
- MicroProse Game Sampler
- Selectware
- Shareware Collection
- Software Treasure Chest
- VGA Spectrum

$6.99 Each

- American Premier Shareware
- Audubon's Birds
- Audubon's Mammals
- California Collection
- Game Arena
- Learning Adventure
- Photo CD Collection
- Sneak Peaks
- Ultimate Collection : Education & Games
- Windows Expert MPC

$7.99 Each

- 20th Century People
- 20th Century Sports
- Best of 20th Century
- Capital Hill
- CD Power Box 2.0
- CD Windows Box1.01
- Dr. Fun Pack
- Dr. Games
- Dr. Music
- Dr. Shareware
- Dr. Windows
- Game Expert MPC
- Image Compendium
- Kids Game
- Kids Rhyme
- My Talking Dictionary
- Super Games Dos
- Super Game I / II / III for Win

$8.99 Each

- 5 Star Game : Animation
- 5 Star Game : Education
- Adventure in Heaven
- Cybergenic Ranger
- Harry's Story Disc & Coloring Book
- Interplay Sampler
- Mario Is Missing + World Atlas 3.2
- Monster Media '93
- Sound Library
- Shareware Heaven
- Too Much Shareware
- Town of Toons
- US Atlas 4.0 MPC

$9.95 Each

- 101 Best Games # 1 DOS
- Audio Tester
- Better Windows & Works
- Best Windows Games (52 games)
- Bible Study and Games
- Discovery Channel Sampler
- Doom Fever + Doom II Accessories
- Font Expert MPC
- Font Elegance
- Font Platinum
- Game Platinum
- Gus Goes to Cybertown
- Hobbies & Leisure WIN
- Home & Business Partners WIN
- Home & Business Platinum
- Kids Games (46 games) WIN
- Learning Games (42 programs) WIN
- Learning Heaven
- Leisure Game Pack (81 games)
- Mother of Clipart
- MPC Multimedia Showcase
- Multimedia Platinum
- Publisher's Platinum
- Planet Fun
- Shareware Heaven II
- Shareware To the Maxx
- Sing-a-long Children (Dr. T's) MPC
- Space Shuttle
- Travel Companion
- Top 201 Games
- Top Ware Limited (500 games)
- Top Ware Spiele (500 games)
- US Helicopter
- US Submarine
- Utilities Platinum
- Windows Platinum
- Wizard MPC
- World + US Atlas

BRODERBUND

Arthur's Birthday MPC	36
Arthur's Teacher Trouble MPC / MAC	17/37
Harry's Haunted House	36
Just Grandma and Me WIN / MAC	17/37
Living Book Sampler	3.99
Math Workshop	38
MYST MPC / Guide Book	45/16
Playroom	35
Printshop Deluxe CD Pack	75
Ruff's Bone MPC	36
The Little Monsters At School MPC	36
The New Kid On The Block / for MAC	35/37
The Tortoise and the Hare / for MAC	35/37
Where in the World is Carmen Sandiego oem.	19

CHESTNUT

All Titles	8.95 each

- 3 Stoogers
- Animal of the World
- Betty Boop
- Bible and Religion
- Bugs Bunny
- Business Clipart
- Circle of Knowledge (2CD)
- Classic Cartoon
- CIA Papers
- Clip Art Warehouse
- Comedy Store : Insane Impersonations
- Complete Home and Office Legal Guide
- Computer Reference Library
- Death Star Arcade Battles
- Dictionary and Languages
- Encyclopedia of Sound
- Fate of Star Lords
- Flash Card Video (Math for grade 2-5)
- Game Jumboree
- Gardening
- Godzilla vs. Megaton
- Ham Radio
- Hilarious Sports Bloopers
- HIV Resource AIDs Guide
- Hugo House of Horrors
- Midi Master Collection
- Multimedia Manian
- Night of the Living Dead
- Our Solar System
- Personal Finance
- Porky Pig
- Sound Sensation
- Technotools
- TV Commercials
- The Complete Book Shop
- Too Many Font Types
- Windoware
- World Traveler

-- Shareware Overload Trio Pack	19

(price) .... special, while supplies last

Chinese Language Series

300 Poems (from Tan Dynasty)	19.99
Basic Conversation #1 (Social Settings)	19.99
Basic Conversation #2 (Personal Ideas)	19.99
Chinese Children's Song	19.99
Chinese Encyclopedia	25.99
Chinese Poems Overview	19.99
Chinese Proverbs In Stories	19.99
Journey to the Source	12
Lexicomp Chinese English Voice Dictionary	25.99

COREL

Corel Artshow '94 (book+CD)	29
Corel Gallery	34
Corel Professional Photo CD	*(19) each

- Butterflies - Birds - Coasts - Deserts
- Food - Fields - Hawaii - Insects
- Lakes & Rivers - Mountains - People
- Resident Interior - Sunrise & Set - Wildlife

Corel Sampler	*(9)

DISCIS Series DOS, WIN, MAC

All Titles .... $9.95 each

A Tree Through The Seasons
Aesop's Fables + Cinderella
Birds and How They Grow
Butterflies
Cinderella + Thomas Swimsuit
Dinosaurs
Farm Animals
Heather Hit Her First Home Run + Peter Rabbit
Moving Gives Me Stomach Ache + Heather
Long Hot Day At The Ranch + Scary Poems
Night Before X'mas + Long Hot Day At Ranch
Paper Bag Princess + Mud Paddle
Somebody Catch My Homework
Spiders
Tale of Benjamin Bunny + Peter Rabbit
The Scary Poems for Rotten Kids
Whales
What Air Can Do

LASER SOFT

Advanced Learning Fun (age 8 & up)	16
Animal Magic (6 games) DOS, WIN	*(23)
Apogee's Greatest Hits	12.50
Banners WIN	*(13)
Board & Strategy (26 games)	*(9.95)
Brain Teasers (28 games)	*(9.95)
Business Made Easy	*(13)
Cards and Dice (24 games)	14
Clip Art & Fonts WIN	*(13)
Doom Companion (24 utility programs)	12.50
Early Learning Fun (age 4-7)	*(13)
Family Learning	*(9.95)
Fly and Drive (4 games)	*(13)
Fonts & Clipart Collection	*(9.95)
Graphics & Sound Explorer (33 utilities)	*(9.95)
Home Computer Start Pack (30 programs)	*(13)
Labels WIN	*(13)
Leader Board Golf Game (16 courses)	15
Links Collector Golf	*(14)
Links Solid Gold - 7 Courses	16.50
Pinball WIN	*(18)
Private Eye	*(13)
Publishers Toolbox (31 utilities)	*(9.95)
Screen Effects	*(9.95)
Top Tracks	*(13)
Triple Tris	*(13)
Video Arcade Classics (33 games)	*(9.95)
Video Gambling WIN	*(15)
Windows Toolbox (33 utilities)	*(9.95)
Wolfeinstein 3D + Blade Stone (companion edt)	14

MEDIA VISION

Critical Path oem / reg	19/26
Forever Growing Garden oem / reg	19/26
Plan-It Adrenaline	26
Plan-It Earth	26
Plan-It Paradise for Win	26
Quantum Gate oem / reg	19/26
Wriggling in Story Land oem / reg	17/26

MICROSOFT

Ancient Land	*(49.95)
Art Gallery Multimedia MPC	55
Cinemania '95 MPC	*(49)55
Complete Baseball oem / reg MPC	29/44.99
Dangerous Creatures oem / reg	29/45
Dinosaur oem / reg MPC	29/55
Encarta '95 oem / reg MPC	45/89
Entertainment Sampler (FD + CD)	6.95
Golf oem / reg MPC	17
Magic School Bus: Human Body	48
Magic School House: Solar Systems	48
Money	*(9)
Multimedia Beethoven 9th Symphony	55
Multimedia Bookshelf '94 WIN	*(49)68
Multimedia Mozart MPC	55
Multimedia Schubert MPC	55
Multimedia Stravinsky MPC	55
Musical Instruments MPC	55
Office 4.3 / 3.0 Professional	*(335)/59
Publisher 1.0	35
Ultimate Robot	57
Visual C++ 32bit for NT	45
Word 2.0 + Bookshelf	35
Works v2.0 / v3.0 + Money	17/35

POWER SOURCE

Titles at .... 7.50 each

- 16 bit Sound Masterpiece
- 25 Windows Graphics Viewer
- 49er Win Games - 14000 Multi. Programs
- All You Can Play - Beauty of San Francisco
- Business Library
- Chinese Common Idioms and Games
- Chinese Painting - Chinese Recipes
- China Traveler - Clip Art Library
- Communication Master
- Complete Linux - Computer Super Market
- Desktop Publisher's Dream
- Game Galore
- Interactive Chinese & Games
- Internet Toolkit - Library Images
- Math Made Fun (MPEG)
- Midi & Wave Workshop
- Music From Heaven
- Programmer Power Tools
- Taiwan Folk Music I, II - Top 101 Shareware
- Travellers Handbook in 6 Languages
- Secret of Korean Beauty
- Sharing 2700 True Type Fonts
- Win 51 Games - World of Education

MPEG Titles .... 7.95 each

- Alibaba 40 Thieves - Girls Lost in Moracco
- Karaoke : Come and Sing Praises
- Jack & Bean Stalk - Popeye Cartoon

Swimwear Series

Exotic Girls 3-in-1 / Island Girls 3-in-1	17/17
Local Girls 3-in-1 / Tropical Girls 3-in-1	17/17
Lovely Lady II	25
Pretty Women WIN, MAC	18
Swimsuits WIN, MAC	18
Swimwear To The Maxx	18
The Women of Venus	20

WALNUT CREEK

4.4 BSD Lite	17
Ada CD Rom v.2	18
Beer - Home Brewing	25
Best Application (business & home)	29
C User Group Library	22
CD Rom of CD Rom	17
CICA MS Windows '94	13
Clipart Cornucopeia	17
Doom Shareware vol.1	8
Doom Tool Kit	15
East Asian Text Processing	23
Fractal Frenzy	17
Free BSD 2.0	call
G N U for Unix & Sun	23
Garbo DOS, MAC	13
GIF Galore	17
Giga Games (3000 titles)	14
Hobbes OS/2	14
Inter Net Info	18
L.A. Collection	18
Libris Brittania	25
Linux 2.0 Tool Kit (2CD)	18
Nebula for Next Step Intel	25
Nova for NEXT	25
Plug and Play Linux '94	22
Project Gutterburg Nov '94	18
QRZ: Ham Radio (call book)	13
Ready to Run Hobbes OS/2	18
Scientific & Technology Library	23
Sentimental Wings	26
Simtel MS Dos (2CD)	13
Source Code for Unix	18
Space and Astronomy	17
Sprite for Sun	14
TCL/TK Source Code	21
Travel Adventure	18
Ultra Mac Games MAC	23
Unix - System V v4.2	29
Visions	23
X11R6 for Unix	23

OTHERS

3D Body Adventure DOS, WIN	39
3D Dinosaur Encyclopedia	42
3D Landscape	48
3D Madness	29.95
5th Fleet	42
7th Guest DOS / Guide Book	19/16
9 Digit Zipcode Phonebook	17
11 Million Business Phonebook '94	15
70 Million Households Phonebook '94	19
101 Best Games #2	13
200 Games WIN	21
200+ Waycool Too! Windows Games	15
500 Fonts WIN	19
A Hard Day's Night WIN	*(17)
Absolute Beginners Multimedia	24
Absolute Mayhem	15
A.D.A.M. Inside Story WIN	46
Aces Critical Mission	15
Aces of the Deep (sierra)	49.95
Advanced Dungeons & Dragons 3-pack	19.99
Adventures (1000 tours) MPC oem	17
Aegis Guardian of Fleet oem / reg	25/49
Air Harvic	43
Aladdin and The Wonderful Lamp	*(9.50)12
Aladdin Activity Center	*(24.99)27
Alone in the Dark 1 + 2	43
Alphabet Blocks (age 3-5)	36
Always Arthur	9.95
Amanda Stories	*(15)
Amazing Universe	36
American Alive Tour Guide 2.0 WIN	19
American Heritage Talking Dictionary	*(19)
American Vista	19.95
Animal Alphabet MPC	18
Animal Safari	34
Animals Clipart	13
Arcade (companion CD)	13
Arctic Baron	29
Armored Fist	49.95
Art Appeal Business / Govt./ Education	19/18/17
Arts & Letters Space Age	35
Asia Alive Tour Guide WIN	15
A.S.P. Shareware	15
Auto Registration '94 WIN, MAC	12
Auto Almanac 1995	14
Barbie Magical House	34
Battle Action Games	11
Battle Chess Multi. Enhanced MPC, MAC	19
Battle Isle 2200	36
Beethoven's 5th Symphony	19
Beginning Reading (age 4-8)	36
Beneath A Steel Sky oem / reg	24/45
Berenstain Bears: Learning At Home	15
Betrayal at Krondon	19.95
Bible Heaven	11
Bible Library (9 books + 20 references)	19
Bicycle Collection DOS oem / reg	*(17)/33
Big Green	16
Blackthrone (by Interplay)	35
Blendor - Music Magazine WIN, MAC	19.99
Blind Date	42
Blue Force	17
Body Works 3.0 MPC	39
Body Works Voyage	29
Bug Adventure	29
Business CD Rom	*(12)
Butterflies of the World MPC	18
Busy Town (age 3 - 7) DOS	29
Campaign	36
Cardshop Plus WIN	16
Castle II DOS	45
Cat Came Back	16
CD CADD 3.7	22
CD Deluxe Pack 4 (Chessmaster 4000, Mavis Typing 2.0, US Atlas 4.0, World Atlas 4.0)	19
CD Games - Kids Collection	11
CD Karaoke (groupware)	18
Challenge Pack (9 games)	16
Chaos Continum MPC	15
Charlie Chaplin Movie	15
Chef Ware - Deluxe DOS, WIN	29
Chess Master 4000 Turbo MPC	16
Christian Clipart	25
Christmas Carol	*(9.95)12
Christmas Screen Saver	9.95
CICA Windows Explosion	11
City 2000 (Combat Evil in London)	19
Civilization	24
Classic Adventure (Bill & Ted, ManiacMansion, Savage Empire, Zak McKracken)	*(15)
Classic Air Battles (F-14, F-19, JetFighter Knights of the Sky)	*(15)
Classic Collection (Audubon's birds + Mammals + Shakespeare + Sherlock Holmes)	19
Club Dead (MTV)	44
Colonization	53
Colossus	17
Combat Jets	39.99
Commanche + 100 Missions DOS	59
Commander Blood	39.95
Companions of Zanth	39.95
Complete Algebra	19
Complete Windows Set (talk)	17
Compton's Interactive Encyc. '95 WIN	29
Compuserve CD	25
Conspiracy	19
Cookbook Heaven vol.1 / vol.2	11/13
Corel Draw 5.0 Unleashed	34
Corridor 7 oem / reg	22/33
Creative Power Imaging 5-in-1 (Aldus Gallery Effects + Aldus Photostyler + Composer + Digital Morph ; Kai's Power Tools)	39
Creature Shock (by Virgin)	52
Creepy Crawlies	18
Crime Patrol	39.95
Cute 'n' Cuddies	*(15)
Cyber Race	15
Cyberia	49.95
Cyberplasm Formula	14
Cyberwar (4CD)	46
Cyclemania	37
D Day's : Normandy 44 (historical review)	36
Dark Legions	19
Dark Seed	17
Dark Sun I : Shattered Lands	19
Dark Sun II : Wake of the Ravager	19
Dawn Patrol	45
Day of the Tentacle	17
Dazzleloids	26
Death Gate	37
Deep Voyager WIN, MAC	*(11)
Delta V	43
Deluxe Game Pack (4 on 1)	
Desert Storm MPC, MAC	
Desert Strike	
Dictionary of the Living World	*(1
Diggers DOS	
Digital Cinema WIN	
Dinosaur Encyclopedia	
Dinosaur Safari MPC	
Doctor's Home Remedies WIN, MAC	*(13)
Don Quixote	*(9.50)
Doom II	
Doom II Accessory Pack #3	19.
Doom II Clue Book	
Doom II Strategy Game Book	
Doom Explosion (for Doom I & II)	19.
Doom Mania	
Dracular Unleashed	
Dragon's Lair DOS	
Dragon Sphere DOS	*(2
Dream Vacation Hawaiian Style	
Drugs (prescription & non-prescription)	
Dune	
EA Kid's : Art Center	
Early Learning Collection	*(13)
Earth Seige	49.
Elder Scrolls Arena (w. multiple ending)	
Electronic Arts: Fantasy Pak (4 titles)	
Electronic Arts: Entertainment Pak (4 titles)	
Electronic Arts: Simulation Pak (4 titles)	
Entombed (3D game)	
Epic Companion	
Europe Alive Tour Guide WIN	
F-14 Fleet Defender	49.
F-15 Strike Eagle III DOS	
F-117A oem / reg	18/
Falcon Gold + 4 Add On	
Family Bible Multimedia	
Family Doctor III MPC	
Family Fun & Learing Pak - 3CD	
Family Zoo Animal Encyclopedia MPC	
Fantasy Adventure 3-pack	19.
Fatal Distraction	
Fifth Street	
Fire Fighter (by Davidson)	*(19.50)
First Wave Game Pak (5 games)	
Flight-Sims (Harrier + Mig29M)	
Flighter Wings	39.
Flying Warbirds	
Font Access	
Font Heaven	
Forbidden Subjects oem	
Frankenstein	
Frontier Elite II	
Gabriel Knight : Sins of the Fathers MPC	
Game Compendium	
Game Gallery	
Game Madness & More (interactive, 2CD)	
Game Magic	
Games to Treasure (2CD)	
Geekwad	
Genghis Khan	
Global Explorer (DeLORME) MPC	
Gold Medallion Games	
Goblins v.1 / v.2 / v.3	15/15/
God of Thunder	
Graphics FS	
Graphics Works	19.
Great Cities I & II	
Great Literature DOS, MAC oem / reg	18/
Great Literature Plus	
Greatest Book Collection DOS, WIN	
Green Environment	
Grolier's Encyclopedia 6.0 MPC/ MAC	*(25)
Grolier's Multmedia Encyclopedia 1995	79.
Grooves	
Guiness Disc of Records '94	
Gunship 2000 oem / reg	17
Hacker Chrumicles	
Halo Desktop Imager WIN	
Health and Medical Phones	
Healthy Cooking MPC, MAC	
Hearts (20 years of Rock 'n Roll)	
Hell - A Cyberpunk Thriller	
Hell Cab WIN oem / reg	27
History of the World PC & MAC	
Holiday Clipart	
Holy Bible DOS	
Home Designer	
Home Medical Advisor Prof	
Home Sweet Home	
Honer Roll Mathematics	
Horde DOS	*(25
How Multimedia Computer Work	
How The World Work	
How Things Grow	
How Things Work	
How Things Work in Busy Town	
Hypnotic Harp MPC	
Image Warehouse	
INCA 1 DOS	
INCA 2 DOS oem / reg	19.95
In the Company of Whales	
Incredible Machine II	
Indiana Jones : Atlantis	*(
Inferno (ocean)	49
Info Magic : CICA for Windows (3CD)	

(price) .... special, while supplies last

Info Magic : InterNet Tools	16
Info Magic : Linux 2CD	14
Info Magic : PERL & TCL/TK	19
Info Magic : Source Code	15
Info Magic : Standard	15
Info Magic : USENET (2CD)	13
Info MAC IV	24
Info Pedia (reference tools)	25
Inherited the Earth	27
International Soccer	17
International Tennis	17
Interplay's Sampler	8.99
Interplay's 10 Year Anthologh (10 games)	25
Iron Helix MPC	19
Japanese for Business WIN, MAC	125
Jazz JackRabbit + One Must Fall 2097	13
Jazz of Multimedia History oem / reg	13/35
J.F.K. Assassination	37
Journeyman Project oem / reg MPC	14/29
Journeyman Project Pro oem	19.50
Jump: David Bowie	32
Jump Raven MPC	39
Just for Kids (learning game)	15
Jutland DOS	19
Kid CAD	36
Kid Works 2 WIN, MAC	36
Kid's Typing	36
Kids Learning Sampler	4.50
King Arthur's Magic Castle	16
King's Quest VII DOS / Demo	54/4.50
Kodak Photo CD Access (oem) WIN	11
Kyrandia I / II - Hand of Fate	16/25
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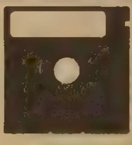

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Open Desktop Dev. Sys. 3.0 - FD/CD	1395/1249
Unix Dev Sys. 3.2 v4.2	950
Unix OS 3.2 v4.2, 1-2 user, full doc.	445
- 16 user full doc. / limit doc.	850/750
- 17+ user full doc. / limit doc.	1225/1095

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ACT! 2.0 for Win	179
Norton Anti-Virus 3.0 for Win & Dos	85
Norton Commander 4.0	69
Norton Desktop 3.0 for Win	112
Norton Speed Drive (speeds Win, Dos, CD)	69
Norton Utilities 8.0	109
On Target for Win (project planning)	89
PC Anywhere 5.0 Remote & Host Dos	115
- v1.0 for Win	119

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Quattro Pro 6.0 for Win - CD	255
- upgrade / competitve trade up	49/89.95
Wordperfect 5.2 for OS/2	*(99)
Wordperfect 6.0 Dos (free upgrade)	*(259)
Wordperfect 6.1 for Win - FD / CD	255/269

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- Freehand 4.0 for Win	379
- Gallery Effect	129
- Pagemaker 5.0 for Win (w. fax scan)	499
-- upgrade	139
-- w. Photostyler 2.0	*(565)649
- Persuasion 2.1 for Win	325
- Photostyler 2.0 for Win oem / reg	295/355
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By Design for Win	59
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- Omni Page Direct OCR 2.0	95
- Omni Page Professional 5.0 for Win	445
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CA Simply Accounting Dos / Win	69/69
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Cakewalk Professional 3.0 for Win	235
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Canvas for Win	265
- competitive trade up	99
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Carbon Copy 2.5 for Win	*(115)
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Check-it Pro Deluxe vol.2 for Dos	135
Check-It Plus 3.0	85
Claris Works for Win	*(55)69
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- v1.0 for Win	95
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Eclipse Fax 1.2 for Win / w. OCR	69/79
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File Maker Pro 2.1 Win	115
- competitive upgrade	99
Floor Plan Plus 3D competitive upgrade	47
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Fractal Design Painter 2.0 for Win	259
- X2 for Win	88
FrameMaker 4.0 for Win	549
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FTP: PC/TCP On-Net	365
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Harvard Graphics 3.0 for Win	275
- upgrade 3.0	95
Harvard Graphics 3.06 Dos	*(325)
Hijaak 2.1 Dos	89
HIjaak Graphics 3.0 WIN	89
Kai's Power Tools 2.0 for Win	115
Kid CAD - FD / CD	29/36
Kid Pix 2 for Win (Broderbund)	38
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Kodak Shoebox Image for Win	*(95)
Laplink V	105
Laplink 6.0 for Win / upgrade	129/85
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QA Plus 4.8 Dos	59
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Uninstaller Network 2.0	*(95)
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Catené. (408)255-1416, (415)593-6259, (510)656-8055. 24 hrs., 1200–14,400. Astrology, jobs, dating, mystical, self-help, singles, files. Free trial, fee. [Exp. #134.]

Dating Tree BBS. (408)946-1431, main number. 8-N-1, 24 hrs., 300–14,400. 408/415/510. Chat, parties, events, large library; over 18 only. Ladies free/free trial. Sysop: Robert Field. [Exp. # 134.]

DSP.COM. (415)647-3213; (510)865-9778, 644-0697, 937-9246, 222-1272. 8-N-1, Personal and professional Internet services, ASP files distribution. Free trial. [Exp. #134.]

Friendship Express BBS. (612)566-5726. Meet kinky people in the Bay Area and all across America. [Exp. #132.]

Nasty Playmates. (408)374-2627, 254-7007; (415)399-1644, 286-1632, 903-0898, 367-6283; (510)782-2482, 441-9777, 657-9092. 50 lines of naughty fun. Adult chat, matchmaker, more. Over 18 only. Free trial, ladies free. [Exp. #133.]

Pathway BBS. (408)956-5600, (510)790-3127. 8-N-1. 1200–14,400. Get into the swing of things. Adults only. [Exp. #134.]

The VidGame BBS. (415)742-6486 (14.4), 742-6618 (28.8), 452-9661; (408)737-7791. Up to 28,800. Windows utilities, games, movie/pics, free Internet email, newsgroups, adult GIFs. Sysop: George Hassmer. [Exp. #134.]

Virtual Pleasures BBS. (408)977-0447; (415)858-2889, 286-0702, 550-9098, 615-0900, 331-3055, 802-0500, 949-1117; (510)254-1525, 939-9616, 215-9875, 791-2551, 888-9204. 24 hrs., 14,400. 44 lines. Intelligent adult chat, 500 forums, 5GB library, vanilla and kinky. [Exp. #134.]

209

ACE InfoSystems. (209)833-0291. 14,400. Doom, other games, news via satellite, shopping mall, fax service, CDs. Fee-based. [Exp. #133.]

Exxxtacy BBS. (209)962-4045. Seven CD-ROMs, DOS/Windows/OS2/ adult files, free adult video with new membership. [Exp. #133.]

408

#1 Fun Seekers. (408)379-0958. 8-N-1, 24 hrs., 14,400+. Four lines. IBM files for all ages, members "free" classified ads. [Exp. #134.]

A32 BBS. (408)378-8252. 9600. Mac, FirstClass, OneNet member network, files, conferences. [Exp. #132.]

AA Computer Masters. (408)225-7367. 24 hrs., 14,400. Two lines. SOFTFIND, vertical markets, hard-to-find software, 10,000+ programs and demos. Free. [Exp. #132.]

Amateur Action BBS. (408)263-3393, 14,400; (408)263-1868, 21,600. 8-N-1. 40 lines. 22,000+ adult amateur GIF files. [Exp. #133.]

Anatomically Correct BBS. (408)733-7429. 24 hrs., 14,400. Adults only. Discussions of adult issues, 100+ X-rated stories, no GIF files, more. Free. Sysop: Howeird. [Exp. #134.]

Auto-PC. (408)229-0403. Find/sell motor vehicles online. Autos, trucks, cycles, boats, and more. Private parties and dealers welcome. Free. [Exp. #132.]

Autos Online. (408)356-1306. 1200–14,400. Shop new car dealers. New and used car locator service. Free. [Exp. #133.]

The Beggar's Tomb. (408)395-1425. Adult GIFs, adult Internet newsgroups. [Exp. #133.]

The Best Way. (408)972-1937. 8-N-1, 24 hrs., 2400–14,400. Nursing topics, no GIFs, discussions on topics, messages. Free. [Exp. #134.]

Brain Country. (408)247-3772. 2400–14,400. Doors, files, usurper. Sysop: Michael Luvara. [Exp. #134.]

Byte Cafe. (408)738-2709. 8-N-1, 24 hrs. Eight lines. Chat, games, and IBM files. Free. Sysop: Carl Bacani. [Exp. #134.]

The Checkered Demon BBS. (408)264-9018. 8-N-1, 24 hrs., up to 14,400. Comic, fantasy, and RPG BBS! Focus on Hero Games products. Sysop: John Taber. [Exp. #132.]

ChristNet BBS. (408)998-3237, voice help (408)438-6658. 2400–14,400. Churches, files, schools, ministries, software, and more. [Exp. #133.]

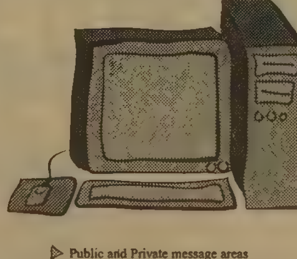
Dads & Kids. (408)998-3237. 2400–14,400. Voice help (408)438-6658. IBM and Mac. Custody, legal, financial, counseling, grandparents, second families, men's groups, and more. [Exp. #133.]

Dalik's Dungeon. (408)263-4584. 300–28,800. CD-ROM. Free. [Exp. #134.]

Danny's Creation. (408)247-9302. 9600–28,800. Files and games. Sysop: Danny Youngs. [Exp. #134.]

Dead-Alive BBS. (408)274-1727. 8-N-1, 24 hrs., 2400–14,400. Free files, Windows, OS/2, NT, games, GIFs, finance, business, email. [Exp. #132.]

Entrepreneur's Cafe. (408)956-0932. 8-N-1, 24 hrs., 14,400. Windows required. Small and home businesses, discussions, SBA, finance, Internet, more.



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Bay Area BBSes

By Kathleen Creighton

A BBS Assortment

After years of laboring in the modem mines for this monthly column (look at all I do for my readers), all I had to do this time was read my email for pointers and press releases. Almost everything that came over the electronic transom piqued my interest.

So that's how this column evolved—don't read anything into the fact that these BBSes appear together!

FACTNet

There are so many things to say about FACTNet that I hardly know where to begin. First, this Denver BBS is a repository of information on cults of all kinds. It is also a pilot project for creating the electronic lending library of the future, an adaptation of the traditional library structure to the electronic format.

"FACTNet" stands for Fight Against Coercive Tactics Network, Inc. It was founded by three people who were once directly involved with cult activity or research. Its stated goal is "to help protect freedom of thought, freedom of choice, freedom of association, and freedom of speech from advances in coercive psychological tactics and systems." It makes a range of keyword-searchable documents available for researchers, journalists, and others who would have interest, such as lawyers in litigation against a cult.

Not having used the lending library aspect of FACTNet, I can't knowledgeably report on it. However, it's obvious that a great deal of thought went into the BBS's proprietary software design. It's also the sort of BBS which puts so much information in front of the caller that it's a good idea to open a capture file before calling. There's almost too much here to absorb at once.

There are a number of different subscriber plans, but access to the BBS just to look around is free. A large number of message areas (called "conferences") are private, some by invitation only.

FACTNet makes use of Usenet and Internet features, including its own World Wide Web page, under construction. The WWW address is http://www.acmeweb.com/factnet and it will ultimately provide the most convenient access.

The FACTNet BBS can be reached at 303/530-1942 (2400–14,400 baud).

American Atheist Online Services

Those of us of a certain age remember the scandal raised by the 1963 Supreme Court decision regarding Madalyn Murray-O'Hair versus the City of Baltimore, banning prayer in public schools. O'Hair, known to this day as the "woman who took the prayer out of public schools," and her husband, Jim Murray, went on to found American Atheist, a membership organization which brings atheists together to work for their rights and for church and state separation.

American Atheist Online Services is an Austin, Texas, BBS, developed and run by their daughter, Robin Murray-O'Hair. (512/302-0223, 2400–14,400 baud). A basic membership to the BBS is $10/year, but nonmembers are invited to explore the guest file, message, and bulletin areas free of charge.

The BBS is geared toward activism, but it also serves as a First Amendment resource. Here you will find message areas, libraries (the original Supreme Court decision regarding school prayer is not here yet, but there are plans to put it in the file area), bulletins regarding the activities of American Atheist and current events (including a list of upcoming media appearances by Jim Murray and Madalyn O'Hair), an online book store, and newsletter and organization subscription and membership information.

There are also echo message areas, Fidonet's A_THEIST, HOLYSMOKE, and EVOLUTION; two privately distributed echoes: AMERICAN ATHEISTS ONLINE and THEIST_WATCH; and the Usenet newsgroup alt.atheism. Robin Murray-O'Hair does read alt.atheism, and would like to extend AAOS participation on the

BULLETIN BOARDS cont.

Free trial. [Exp. #133.]

Escape To Other Worlds BBS. (408)956-1750. 14,400. Four lines. SF/fantasy/ comics, RIME, Fido, chat, shareware, adult files, 2GB. [Exp. #133.]

EternaL DoOM. (408)942-1659. 8-N-1, 24 hrs., 2400–14,400. Lots of files, games, message bases. New users extremely welcome! Free. [Exp. #134.]

EXODUS/BDPA Silicon Valley Chapter. (408)654-8911. 8-N-1, 28,800. EXODUS newsmagazine + Black Data Processing Associates; multicultural publication + IT professionals; BDPANet/ Afronet/Internet email. Sysop: Willie Mackey. [Exp. #133.]

Family Preservation Society BBS. (408)996-8473. 8-N-1, 24 hrs., 14,400. Legal and informational issues concerning the family, large legal file base. Free. [Exp. #133.]

Friends Of Republicans BBS. (408)247-3229. 8-N-1, 14,400. Republican's BBS for the good of all. Msg. area, private mail, libraries. Donation supported. [Exp. #134.]

Garlique Graphics Image Center. (408)847-0665, 847-5076. Adult GIFs, Internet newsgroups, shareware, adult CD, instant access. Excellence online. [Exp. #134.]

The Gnome's Guesthouse BBS. (408)448-5705, -5657, -5713, -5655, -6235. 8-N-1, 24 hrs., 4 @ 14,400, 1 @ 9600. Five lines. Chat, CircleMUD, adult areas, FRPs, files, all ages. Free. [Exp. #134.]

The Hidden Lair BBS. (408)979-0812. 1200–28,800. Multichat, adult files, games, message bases, 2GB of storage. Free. Sysop: Drakkhen. [Exp. #134.]

Matrix Online Service. (408)378-6588. 14,400. New phone number!!! BBS gateway service, games, 'zines, gov't. job listings. Sysop: Darryl Perry. [Exp. #134.]

The Meating Place BBS. (408)926-6174. 24 hrs., 14,400. Nine lines. Gay/Bi, adult, email, chat, matchmaker, GIFs, XXX stories. System password: MICRO. [Exp. #134.]

Mongoose BBS. (408)733-3034. 24 hrs., 14,400/ 16,800. Two lines. SmartNet, 4+GB of the latest shareware on CD-ROM. Free. Sysop: Robert Yagmourian. [Exp. #133.]

Monterey Gaming System. (408)655-5555. 14,400. 32 lines. Free Internet email, chat, contests, games, Doom/Doom II. Free trial. [Exp. #133.]

Mountain Retreat. (408)335-4595. 24 hrs., 14,400. FidoNet, 2.9GB HD, 20,000+ files, Turbo Pascal is the specialty. Sysop: John Jamieson. [Exp. #133.]

NOHO BBS. (408)259-3867. 2400–14,400. Wildnet, AR-Net, Uni-Net echomail, Internet newsgroups, 30,000+ files, and more. Sysop: Brian Parker. [Exp. #132.]

Paradise City BBS. (408)280-6630. 2400– 14,400. 25,000+ newest IBM, Windows, adult files. RIP EGA graphics, mouse support. Free. Sysop: Jim Reed. [Exp. #133.]

P.D.S.E. (408)241-0722. 8-N-1, 24 hrs., 2400–9600. Eight lines. Clean files, discussions, games, helpful people. [Exp. #134.]

Positive Image Studio. (408)270-8916. 8-N-1, 24 hrs., 300–28,800. Six lines. First-Class, One-Net member, files, Mac, adult, PC/Win. [Exp. #134.]

The Rising Storm. (408)926-9445. 8-N-1, 24 hrs., 14,400. Information for patriots. Survnet, Crossnet. Packet in the near future. [Exp. #133.]

The Shuttle BBS. (408)289-1911. 24 hrs., 28,800. 3.0GB of files, Doom, multimedia, online games, and more. Sysop: Michael Vedda. [Exp. #133.]

The Silicon Matchmaker. (408)492-9700. 24 hrs., 300–14,400. 20 lines. Personal introductions—you meet the nicest people online. [Exp. #133.]

SJ Advisor. (408)274-6004. 8-N-1, 10 am–11 pm, 300–17,600. Politically oriented. City, county, state, and fed. Election and legislative info. Free. [Exp. #133.]

The Support Network BBS. (408)259-0297. 8-N-1, 24hrs., 2400–14,400. ADA Network, ABLEDATA database, Trace Research Center Library, educational files, RIP graphics. Free. Sysop: Frank Arnold. [Exp. #134.]

Sweet Whispers BBS. (408)229-9001. 8-N-1, 24 hrs., 14,400. 10 lines. Adult social network, chat, MatchMaker, email, forums, library, RIP. Free trial. [Exp. #134.]

Thunder Mountain BBS. (408)842-0764. 8-N-1, 24 hrs., 2400–14,400. Six lines. Chat, games, CD-ROM, matchmaker, user friendly. Free after validation. [Exp. #134.]

TIPS BBS. (408)265-7529. 8-N-1, 24 hrs., 1200–14,400. Internet email, Usenet newsgroups, latest shareware, technical support. Free/fee. [Exp. #134.]

VidGam2 BBS. (408)737-7791. Nine nodes. Multizone; steamy adult GIFs; games; utils.; Internet newsgroups, email, FTP-mail. Sysop: Marcelo Hassmer. [Exp. #134.]

The Warped Disk. (408)288-6891. Files, chat, forums, photos, adult, RIP, more. Free audio CD w/subscription. [Exp. #133.]

The X-Files BBS. (408)476-6237. 1200–14,400. Door games and many adult files, VirtualNet. No ratios. Free. Sysops: Guido Crepax and Space Cowboy. [Exp. #134.]

415

A.S.D.I.P. (415)468-3886. up to 28,800. Six lines. 42,000 files, over 14GB, adult issues. Free trial. [Exp. #134.]

The Baud BBS (415)343-5799. 24 hrs, 9600+. You won't believe your eyes! Multitasking Windows BBS! Internet, 5+GB of files. [Exp. #133.]

Bay Area Luv Connection. (415)822-7550. 24 hrs., 16 lines. Adult board. Fee, women free. Voice: (415)239-1028. Sysop: Ronni (voice: 415/239-0802). [Exp. #133.]

Bay Area State Parks. (415)726-0358. 24 hrs., 9600. Bay Area State Parks information BBS. Free. [Exp. #134.]

BayHomeNet. (415)570-7133. 24 hrs., 9600. Public access real estate, Q&A, mortgage rates, first-timer programs, more! [Exp. #133.]

Bay Window BBS. (415)755-2939. 24 hrs. DOS, Windows, games, utilities, no GIFs or handles allowed. Sysop: Judy. [Exp. #132.]

The Cosmic Cube. (415)583-2780. 24 hrs., 14,400. Multinetworked. Sci-fi/science/general strategy space gamers. So. San Francisco. Free. [Exp. #134.]

CRC BBS. (415)428-3702. 24 hrs., Educational games and related programs for teachers and students. Free. [Exp. #133.]

Dragon Ball BBS. (415)731-9265. Tons of files, mostly

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BBS Spotlight cont.

Internet generally, but is hampered by the expense and limited access to the Internet in the Austin area.

Caveat: While people of differing beliefs do often agree regarding church and state separation issues, the echo message areas on this BBS are not for the easily offended.

American Atheist Online Services is much more than I can describe here, and serves as a model for any organization serious about being online.

X-Philes Online!

If you live and die by the TV show *X-Files*, the X-Philes, a new fan BBS, might be for you. Get your X-Files Windows wallpaper here! Large file area of "creative stories" centering on *X-Files* characters. Get together with other fans and watch old episodes. Message areas, including Vetlink. (510/251-9413, 2400–14,400 baud, sysop Mary Pryne-Mankowski).

The Nerdshack

If you've been reading this column for very long, you know that I like BBSes that are well organized (preferably around a theme), up-to-date, and free of typos (picky, picky, picky).

But I've also got a soft spot in my online heart for the terminally quirky. So when Nerdshack sysop Porter Venn (aka Snuh Gabuh) sent me amusing email inviting me to take a look at the BBS he and his roommates operate in San Francisco's Haight-Ashbury, I had to take a look.

The opening screen certifies the sysop as being too lazy to do any kind of verification, and "it's a free lunch!" (I admit I corrected the spelling of "it's" there in that last sentence.) The BBS also looks like it's been suffering from a little inattention due to, apparently, resident nerds with paid jobs with overtime, but bring your sense of humor because that's what this BBS is about.

Oh, it has Usenet newsgroups, a CD-ROM, and games, too, but who cares? (415/681-1724, 300–14,400 baud.) ■

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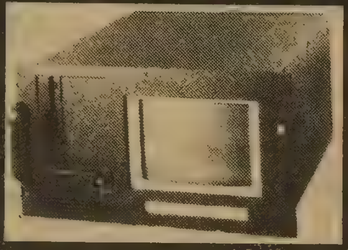

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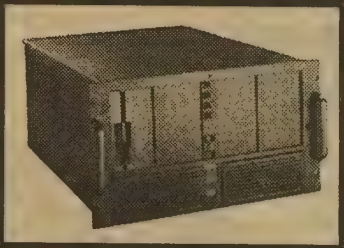
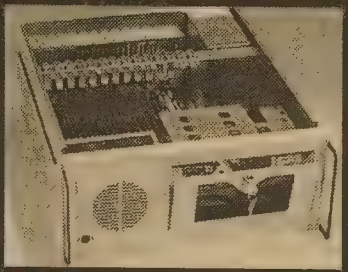


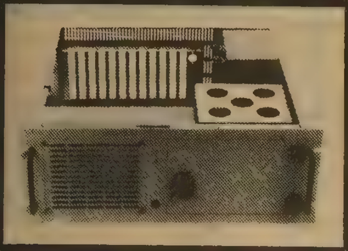
- 8, 14 & 20 Slot Options
- Dual Power Supplies
- Power Supply Redundancy Option
- 8 Drive Bays
- 8 Fans
- Motherboard or Passive Backplane
- 200-1000 Watt Power Supply
- USA Manufactured

19" RACKMOUNT STEEL INDUSTRIAL CHASSIS



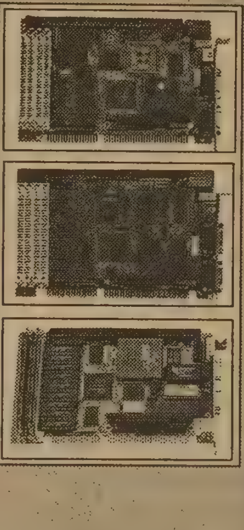
- Supports 2x5.25" & 3x3.5" 1/2 Ht. HDD's
- Vibration Damper
- 250W Power Supply
- Safety Approved For TUV/FCC/UL/CSA EMI Req: FTZ & FCC
- Cooling Fan

MADE IN U.S.A.



Call us with your specifications

HALF-SIZE CPU CARDS



PC/AT 386SX/486SLC
1/2 Size All-In-One SBC
CPU
Cx486SLC-33 MHz or 80386SX-40 MHz
Memory
512KB-16MB DRAM
- Supports EPROM/FLASH disk. Up to 1.44 MB

PC/AT386DX
1/2 Size All-In One SBC
CPU
AMD 80386DX-40 On Board
Cache
128K Cache On Board
Memory
1-64MB DRAM
- 8 Layers With Double Sided SMT PCB

PC/AT 486DX
1/2 Size All-In-One SBC
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Cyrix Cx486 or 80486SX/DX/DX2, Clock Rate from 25MHz to 66MHz
Cache
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Memory
1-64MB DRAM

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- MULTI-COMMUNICATION SYSTEM
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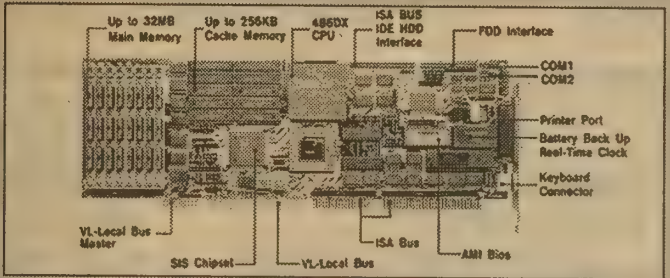
- 24 DIFFERENT SYSTEMS CAPABILITY RUNNING AT SAME TIME
- CAPABLE OF CUSTOMIZED SPECIFICATIONS

VESA LOCAL BUS CPU CARD



- 4 Upgradable Models using Intel CPU's
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  - -80486SX-25/33 MHz
  - -80486DX-33/50 MHz
  - -80486DX2-25/50 & 33/66 MHz
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- 256K Write Back Cache Memory
- Up to 32 MB of 70ns SIMM DRAM
- IDE Hard Disk & Floppy Disk Controller
- 2 Serial/1 Parallel Ports
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- 18 SLOT SEGMENTED 5,4,4,5
- 20 SLOT SEGMENTED 5,5,5,5

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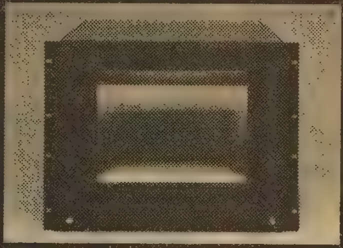
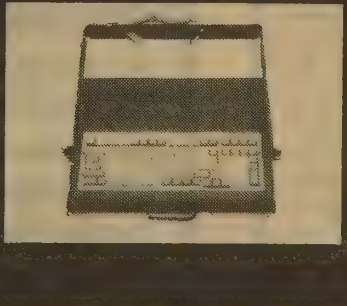
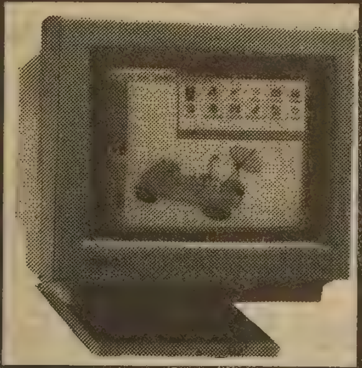


19" RACKMOUNT KEYBOARD





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Lincoln's Cabin BBS. (415)752-4490. 2400–28,800. Internet email, Usenet, RIME, *Boardwatch* and *Connect* magazines, files! Free trial. [Exp. #134.]

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Window World BBS. (415)931-0649. 24 hrs. For people who use Windows-type software; info, shareware, chat. Sysop: Bob Cram. [Exp. #134.]

510

8-Bit Apple User Group. (510)294-8052. 24 hrs., 300–2400. Apple II, UL/DL, email, games. No fees. Sysop: Noel Anklam. [Exp. #133.]

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KRIJAQ BBS. (510)673-0103. 8-N-1, 24 hrs., 14,400. 100% free, download 60 mins. every call. CD-ROM disk catalogs. Sysop: John Dulaney. [Exp. #132.]

Last Chance BBS. (510)796-1378. 14,400. Message bases, Fnet, X-fers, online games. Free. Sysop: Poky. [Exp. #133.]

The Lost Worlds BBS. (510)888-1714. 24 hrs., 14,400. 10GB, 6GB adult; easiest to use interface, he who comes rarely leaves... [Exp. #133.]

mediacom—USA BBS. (510)521-5757. 8-N-1, 24 hrs., 2400–28,800. Support and registration site for terminal program TERMINATE and Archiver RAR. Free access. [Exp. #134.]

Metropolis. (510)231-0353. 2400–28,800. Rime, Internet email, Usenet newsgroups, FidoNet, WCLawnet; Apogee/Software Creations distribution; more. Free trial. Sysop: Michael Chen. [Exp. #132.]

Orion. (510)447-1060. 28,800. Two nodes. Space/science/computers related, 2GB d/l files, msg. base. Sysop: Shaun Coleman. [Exp. #134.]

Otoko Empire BBS. (510)370-6253. 24 hrs., 1200–14,400. Male GIFs: large galleries of Asian, Black, and Latino files. Adult reg. req. Free/pay. [Exp. #134.]

The Phantom Zone BBS. (510)538-9586. 8-N-1, 24 hrs., 300–14,400. Three lines. Files, messages, games, echomail, FidoNet, Internet email, friendly sysop. [Exp. #133.]

Pleasant BBS! (510)689-0519,,22. 24 hrs., 14,400. Most new GIFs, games, shareware, adult files, more. Very friendly sysop. Free/fees. [Exp. #134.]

Pleasure Palace. (510)489-3778. 2400–14,400. Adult chat, GIFs, and fun. Free trial membership/ladies free. [Exp. #133.]

ReeseCom BBS. (510)745-0365. 8-N-1, 24 hrs., 14,400. Multilines. Files, messages, conferences. Support for N-SYNC software, Reese's Computer Service. [Exp. #134.]

Silicon Knights BBS. (510)676-7640. 24 hrs., 14,400. FidoNet, Usenet, Internet email; support for Novell professionals. Free access/donations. Sysop: Steve Gleisner, Ed Donegan CNE. [Exp. #133.]

Single Life. (510)796-2895. 8-N-1, 24 hrs., 2400– 14,400. New BBS for heterosexual singles. Personals, events for singles, Matchmaker. Fee. [Exp. #134.]

Smorgasbord BBS. (510)440-1125. 2400–28,800. Fremont, Sunnyvale, Milpitas. 75,000 files, Internet. Free prize draw. [Exp. #134.]

VA Listings. (510)637-1261. 24 hrs., 300–9600. Multiline. VA-owned homes for sale. Sysop: David Piersall. [Exp. #132.]

Viper 1 Premium BBS. (510)535-0315, 535-0231. 8-N-1, 2400–28,800. 10 lines. Four Internet nodes, 11GB, large adult file areas, more coming. [Exp. #133.]

The VisualAge BBS. (510)685-9585. 24 hrs., 2400–14,400. Multinode. Local echomail nets, Internet coming soon!, doors, three CD-ROMs. Free/pay. Sysop: David R. Afana. [Exp. #134.]

Windows Online. (510)736-8343. Largest Windows BBS. Members receive free Internet, 30,000 Win 3.x files. Free trial. [Exp. #134.]

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X-Philes BBS. (510)251-9413. 8-N-1, 14,400. X Files stories, GIFs, JPGs related to the TV show; Vetlink. No fee. Sysop: Jon Mankowski. [Exp. #132.]

707

The Party Line BBS. (707)588-8055. 24 hrs., up to 14,400. 12 lines. ChatLink every night, multiplayer games, Homebrew Digest, and more! Sysop: Jami Chism. [Exp. #134.]

Recommended Information Service. (707)448-2225. 2400–14,400. 15 lines. Multiplayer games, nationwide ChatLink, teleconference, Internet email. 30¢/hr. Sysop: Scott Baldwin. [Exp. #134.]

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916

24th Street Exchange. (916)448-2483. 8-N-1, 24 hrs., up to 28,800. 38 lines, 21 CDs, FidoNet, USA Today, PC catalog, Internet email, chat. [Exp. #133.]

USER GROUPS

AMIGA

AGA. Meetings: 7th of each month, 7:00 pm, downtown SF. Graphics users group for all Amiga users of 2-D, 3-D, animation, multimedia, and video software. Call: Ollie, (415)863-8792. [Exp. #132.]

AUM—Amiga Users Of Marin. Meetings: 3rd Wed., 7:00 pm, College of Marin Science Center, Rm. 192, Kentfield. Desktop video, Amiga applications. Call: (415)479-6717. BBS: (415)459-6621. [Exp. #133.]

AWEST—Amiga Users In SF. Meetings: 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission St. (near Ocean), San Francisco. Call: (415)584-8406. BBS: (415)441-5145. [Exp. #133.]

RE-Amiga—Redwood Empire Amiga User Group. Meetings: 2nd Tues., 7:30 pm. Call: (707)523-9978. BBS: (707)539-6944. [Exp. #133.]

TOGA—The Other Group Of Amigoids. Meetings: varying Sat., 12:30 pm, Milpitas Community Library, 40 N. Milpitas Blvd., Milpitas. An informal group to share ideas, PD software, and information. Call: Lawrence Brown, (408)984-6036; Randy Abel, (408)356-9405; toga@cup.portal.com . [Exp. #132.]

Winner's Circle. Meetings: 2nd Wed., Berkeley. Demo new products, chat with other Amiga users. Call: Jack, (510)845-4814; BBS, (510)845-4812. [Exp. #132.]

APPLE

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Beginners and advanced, Q&A, new product demos, public domain software. Call: Kent Fillmore, (415)571-1433. [Exp. #133.]

SPC Apple User Group. Meetings: 2nd Tues., 7:00 pm, CompUSA, Newpark Mall, Newark (I-880 exit west on Steveson or Morey). The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Dean Fearn, (510)881-9160. [Exp. #133.]

ATARI

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Main Library, Estudillo Room, 300 Estudillo Ave. 8/16/32-bit, SIGs. Call: Robbie, (510)797-5636. [Exp. #133.]

CAD

BMUG CAD SIG. Meetings: last Wed., 6:00 pm, Academy of Art College, 79 New Montgomery, San Francisco. Environmental design/drafting. Call: (510)549-BMUG. [Exp. #137.]

MAUG—Marin AutoCAD Users Group. Meetings: 1st Thurs., 6:30 pm, Autodesk, 3950 Civic Ctr. Dr., Demo Room, San Rafael. Call: Priscilla Mills, (415)453-4480. [Exp. #133.]

Sonoma County AutoCAD Users Group. Meetings: 3rd Wed., 6:30 pm, Piner High School, Rm. H-83, 1700 Fulton Rd., Santa Rosa. Call: John Weitzel, (707)525-8147. [Exp. #137.]

COMMODORE

C=HUG (Commodore Hayward User Group). Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (510)531-3734. [Exp. #137.]

COW—Commodore Owner's Workshop. Meetings: 3rd Thurs., 7:00 pm, San Bruno. Demos and assistance for all Amiga users. Call: Steve Beale, (415)355-8927; BBS, (415)359-5975. [Exp. #132.]

Diablo Valley Commodore Users Group. Meetings: 3rd Thurs., 7:00 pm, Contra Costa Water District Anteroom, 1331 Concord Ave., Concord. Call: (510)689-3224. [Exp. #137.]

DESKTOP PUBLISHING

BMUG Desktop Publishing And Design SIG. Meetings: 3rd. Tues., 6:30, S.F. Police Academy, 350 Amber, San Francisco. Call: Les Cowan, (415)641-6033. [Exp. #137.]

IBM AND COMPATIBLES

BAYTALK. Meetings: 3rd Tues., 6:00 pm, Sun Peking Restaurant, 2068 Center St., Berkeley. For low-vision and other disabled persons; learn about adaptive technology and develop computer skills. Call: (415)777-4777. [Exp. #133.]

Diablo Valley User Group—DVPC. Meetings: 1st Thurs., 7:30 pm, Bank of America, Bldg. B, Clayton Rd. at Galindo, Walnut Creek. SIGs include Windows, Paradox, Beginner's, Visual Basic, education/entertainment, and more. Call: (510)943-1367. [Exp. #134.]

EastBay FOG. Meetings: 2nd Wed., 7:30 pm, Episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Montclair. All microcomputers, MS-DOS, CP/M. Call: (510)653-2627. [Exp. #137.]

F.U.N. PC Users Group. Meetings: 1st Wed., 6:00 pm, CompUSA, Training Room, Newpark Mall, Newark (I-880 exit west on Steveson or Morey). Visitors welcome, no experience necessary. Call: (510)795-4286 #8. [Exp. #133.]

Golden Gate Computer Society. Meetings: 4th Mon., 7:00 pm, San Rafael Community Center, 618 B St., San Rafael. Free intro to computers class at 6:00 pm. Call: (415)454-5556. [Exp. #137.]

Napa Valley PC Users Group. Meetings: 2nd Wed., 7:30 pm, Napa High School Lecture Hall, 2475 Jefferson St., Napa. Call: Lee Schwab, (707)257-2675. [Exp. #132.]

NaSPA Bay Area Chapter. Meetings: last Tues. of odd-numbered months, 3131 Zanker (near First and Montague), San Jose. Technical aspects of corporate computing with emphasis on IBM and compatible mainframes. Call: Radi Shourbaji, (408)526-3258. [Exp. #133.]

PC Clubhouse. Meetings: 1st Fri., 8:00 pm, Meiklejohn Hall, Room 2002, CSU Hayward. To share knowledge and PD/shareware software; maintains network of BBSes; mentor assistance; SIGs. Call: (510)538-2449. [Exp. #132.]

PC Users Group Of The Redwoods. Meetings: 2nd Thurs., 6:30 pm, Santa Rosa Veteran's Memorial Building, East Dining Room, Maple Ave., Santa Rosa. Call: (707)527-USER; or Mel Del Gallo, (707)571-0373. [Exp. #133.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm. 110 Pacific #153, San Francisco. For those who use computers in business. Visitors $10. Call: Jordan Rosenberg, (415)788-5338. MCI Mail: 425-1545. [Exp. #132.]

San Francisco Computer Society. Meetings: 4th Mon., 7:00 pm, Presbyterian Church, 1329 7th Ave., San Francisco. CPM and DOS Call: Bob Forsberg

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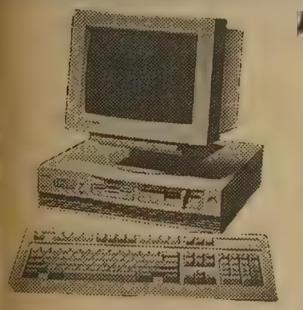

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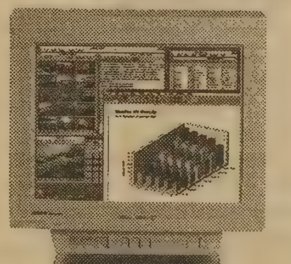

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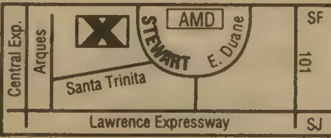

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USER GROUPS cont.

(415)885-6202. [Exp. #132.]

San Francisco PC Users Group. Meetings: 3rd Tues., 6:15 pm SIGs, 7:30 pm General Meeting. St. Mary's Conference Center, 1111 Gough St., San Francisco. Call: (415)346-2644, events; Kendall Callas, (415)821-1310; Loyd Cribs, (415)751-5219. [Exp. #137.]

SEF Business Operations SIG. Meetings: 1st Tues., 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. A special interest group of the Software Entrepreneurs' Forum. Call: Mike Schmit, (408)244-6826. [Exp. #133.]

SEF International Software SIG. Meetings: 3rd Mon., 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. A special interest group of the Software Entrepreneurs' Forum. Call: Charlie Pfefferkorn, (408)923-7570. [Exp. #133.]

South Bay WordPerfect User Group. Meetings: 4th Tues. (no Dec. meeting), Saratoga Community Library, Fruitvale and Saratoga Ave., Saratoga. Free. Call: Scott Maiden, (408)253-4591. [Exp. #133.]

Stanford Palo Alto Area PC User Group. Meetings: last Wed., 7:30 pm, Varian Auditorium, 3075 Hansen Way (off Page Mil Road), Palo Alto. Call: (415)329-8252. [Exp. #134.]

INTERNET

BMUG Internet SIG. Meetings: 2nd and 4th Weds., 7:00 pm, BMUG office, 2055 Center St., Berkeley. Accessing the Internet through World Wide Web using the Macintosh. Email: dan_meriwether or susan_adrian @bmug.org . [Exp. #137.]

Online And Interactive SIG. Meetings: 3rd Tues., 6:30 pm, usually at Software Publishing Corp., Bldg. 3, 3165 Kifer Rd., Sunnyvale. SIG of the Silicon Valley chapter of the Society for Technical Communication. Call: Charly Rhoades, (408)379-7000 ext. 1414 or charly@hal.com . [Exp. #137.]

SEF Internet SIG. Meetings: 2nd Wed., 7:30 pm, Sun Microsystems, 2750 Coast Ave., Bldg. 6, Mountain View. $10 for nonmembers. Call: (415)390-9477. [Exp. #137.]

LEGAL

BMUG Law SIG/ Law SIG South. Meetings: irregular. Call: Randy, (916)661-2280 or rbs@aol.com . [Exp. #137.]

SF Bar Assoc. WordPerfect User Group. Meetings: 3rd Wed., odd-numbered months, noon, SF Bar Assoc. Boardroom, 7th Fl., 685 Market St. Brown bag meetings. Call: (415)421-5650. [Exp. #137.]

MACINTOSH

Association Of A32 Users. Meetings: 2nd Sat., 10:00 am, Sunnyvale Community Center Arboretum, 550 E. Remington Ave. (near corner of El Camino and Fair Oaks). Q&A session; guest speakers and vendor demonstrations; shareware, freeware, and PD software disks. Call: (408)263-0398. [Exp. #133.]

BMUG—Berkeley Macintosh User Group. Meetings: every Thurs., 6:00 pm, Warren Hall, Rm. 22, UC Berkeley campus. Call: (510)549-BMUG. [Exp. #137.]

BMUG LesBiGay SIG. Meetings: 3rd Sun., 6:00 pm, BMUG office, 2055 Center St., Berkeley. Call: see the LesBiGay conference on Planet BMUG (bmug.org). [Exp. #137.]

BMUG West. Meetings: last Mon., 6:30 pm, San Francisco Exploratorium. Call: (510)549-BMUG. [Exp. #137.]

Diablo Valley Macintosh User Group (DVMUG). Meetings: 3rd Tues., 7:00 pm, Bancroft School, 2200 Parish Dr., Walnut Creek. Get together with Mac and Performa users. Enjoyable SIG meetings. Call: (510)827-5775. [Exp. #133.]

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 7:00 pm, Apple Computer, R&D Campus, 1 Infinite Loop, Cupertino. A forum for multilingual/multiscript computing. Call: Roger Sherman, (415)859-5146. [Exp. #137.]

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Beginners and advanced, Q&A, new product demos, public domain software. Call: Kent Fillmore, (415)571-1433. [Exp. #133.]

SEF Macintosh SIG. Meetings: 3rd Tues., 7:00 pm, Apple Auditorium, 4 Infinite Loop, Cupertino. Sponsored by Software Entrepreneurs' Forum. Call: Jeff Cherniss, (408)358-5150. [Exp. #137.]

SMUG (Stanford Palo Alto Macintosh User's Group). Meetings: 1st Mon., 7:00 pm, Syntex Conference Center, 3401 Hillview Ave., Palo Alto. Call: (415)328-4933. [Exp. #137.]

MARKETING

SEF Marketing SIG. Meetings: 4th Thurs., 7:00 pm, Cubberley Community Center, Rm. H-1, 4000 Middlefield Rd., Palo Alto. A special interest group of the Software Entrepreneurs' Forum. Call: Bill Ryan, (415)615-7906. [Exp. #133.]

MISCELLANEOUS

California Genealogical Society SIG. Meetings: 2nd Sat. odd months, CGS Library, 300 Brannan St., 4th Fl., San Francisco. All makes, models, and software welcome. Call: Dave Wilma, (415)777-9936 or DaveW50789@aol.com . [Exp. #134.]

MULTIMEDIA

Joe's Digital Diner. Meetings: every other week, 5:30 interactive happy hour, 7:00 pm dinner, 8:00 pm showcase, 3435 Army St., Ste. 222 (at Valencia), San Francisco. An evening mixing home cooking, six multimedia stations, and a special presentation on new media, Internet, etc. Call: (415)824-9394. [Exp. #137.]

Macromedia User Group. Meetings: 1st Tues. (except Jan.), 6:00 pm, 600 Townsend St. at 7th, San Francisco. For multimedia developers of all levels who use Macromedia products. $5. Call: (415)252-2295. [Exp. #137.]

SEF Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Center for Software Development, 111 W. St. John St., Suite 200, downtown San Jose. SIG of Software Entrepreneurs' Forum. Call: Ralph Gilman, (408)746-0551. [Exp. #137.]

NETWORKING

Apple Network Manager's Association. Meetings: 3rd Thurs., 5:30 pm, Syntex Laboratories, Palo Alto. A forum for discussing problems and solutions associated with managing mixed environments with AppleTalk networks. Call: Bill Woodcock, (510)843-6369, email woody@zocalo.com for directions. [Exp. #137.]

BMUG Networking SIG. Meetings: 4th Tues., 7:00 pm, BMUG office, 2055 Center St., Berkeley. Call: James, (510)233-7151. [Exp. #137.]

Networking Windows SIG. Meetings: 3rd Wed., El Cerrito. For users of Windows for Workgroups, 95, NT, Advanced Server. Call: (510)528-9895. [Exp. #134.]

SEF Client/Server SIG. Meetings: 4th Tues., 7:00 pm, Cubberly Community Ctr., Rm. H-1, 4000 Middlefield Rd., Palo Alto. A special interest group of the Software Entrepreneurs' Forum. Call: Patrick O'Brien, (415)726-4664. [Exp. #133.]

NOVELL

Silicon Valley NetWare Users Group. Meetings: 3rd Wed., 6:30 pm, Sundowner Inn, Sunnyvale. Call: (408)954-0585, x590. [Exp. #132.]

South Bay NetWare Users Group. Meetings: monthly, 6:00 pm, 890 Ross Dr., Sunnyvale. Call: Allan Hurst, (415)525-4567 or allanh@spectrum.us.com . [Exp. #134.]

PARADOX

bapals (Bay Area Paradox User Group). Meetings: 4th Tues., 5:00 pm, McKesson Building, 1 Post St., 18th Fl., San Francisco. Call: (415)995-4688. [Exp. #133.]

PEN

SEF Pen/Mobile Computing SIG. Meetings: 4th Wed., 7:00 pm, Cubberley Community Center, Rm. H-1, 4000 Middlefield Rd., Palo Alto. A special interest group of the Software Entrepreneurs' Forum. Call: Bill McAlpine, (415)348-2257. [Exp. #133.]

Stanford Newton User Group. Meetings: 2nd & 4th Tues., 7:00 pm, Printer's Inc. Bookstore Cafe, 310 California Ave., Palo Alto. Call: Flash Sheridan, (415)462-9203 or FlaSheridn@rahul.net . [Exp. #134.]

PROGRAMMING LANGUAGES

BMUG Forth SIG. Meetings: 2nd Sat., 12:00 pm, BMUG office, 2055 Center St., Berkeley. Forth for beginners, 12 noon; introductions, 1:00 pm; talks and demos 1:30–5:00 pm. Call: Leonard, (510)376-5241. [Exp. #137.]

BMUG Programmers' SIG. Meetings: alternate Weds., 7:00 pm, BMUG office, 2055 Center St., Berkeley. Mac Toolbox, C, and Pascal. Call: (510)549-BMUG. [Exp. #137.]

Forth Interest Group, North Bay Chapter. Meetings: 2nd Sat., 1–5 pm, tutorial at noon, 2055 Center St., Berkeley. Call: Leonard Morgenstern, (510)376-5241. [Exp. #132.]

SEF C/C++ SIG. Meetings: 4th Fri., 6:15 pm, UC Santa Cruz Extension, 3120 De La Cruz Blvd. (Trimble at 101), Santa Clara. A new special interest group of the Software Entrepreneurs' Forum. Call: Marian Corcoran, mcorcora@ix.netcom.com [Exp. #137.]

SEF Intelligent Systems SIG. Meetings: 2nd Mon., 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. A special interest group of the Software Entrepreneurs' Forum. Call: Leor Jacob, (415)595-5200. [Exp. #133.]

SEF Visual BASIC SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Sponsored by Software Entrepreneurs' Forum. Call: Allan Colby, (415)851-4567. [Exp. #133.]

Silicon Valley Forth Interest Group. Meetings: 4th Sat., 10:00 am–5:00 pm, 230 Lincoln Centre Dr., Foster City. Call: Dr. C.H. Ting, (415)638-5669 (w), 571-7639 (h). [Exp. #137.]

PROJECT MANAGEMENT

Microsoft Project Users Group. Meetings: 3rd Tues., alternates between San Jose and Foster City. Q&A, speakers, product demos, and other topics related to Microsoft Project and project management. Call: Jim Spiller, (707)425-2484. [Exp. #137.]

TEXAS INSTRUMENTS

TI-99/4A. Meetings: 2nd Sat., Oakland. Call: Fred, (510)530-8335. [Exp. #133.]

UNIX

International Linux Association. Meetings: 3rd Mon., 7:00 pm, International House of Pancakes, 5403 Stevens Creek Blvd. (off I-280 Lawrence Expwy. South, next to Howard Johnson Hotel), Santa Clara. Learn/use UNIX, X-Windows, Internet through Linux. See Linux change the computing world. Call: (408)369-9818, email alte@rahul.net . [Exp. #132.]

SEF UniForum Open Systems SIG. Meetings: 2nd Tues., 7:00 pm, DEC Auditorium, 130 Lytton Ave., Palo Alto. A special interest group of the Software Entrepreneurs' Forum. Call: George Bosworth, (415)851-3304. [Exp. #133.]

VIDEO TOASTER

Bay Area Video Toaster Users Group. Meetings: 4th Tues., 7:00 pm, Richmond Public Library, Whittlesey Room, 325 Civic Center Plaza, Richmond. Product demos, guests, info, tips, and much more. Call: Don Smith, (510)620-6759. [Exp. #133.]

Silicon Valley Video Toaster Users Group. Meetings: last Thurs., 7:00 pm, HT Electronics, 275 N. Mathilda Ave., Sunnyvale. Special guests, equipment demos, hands-on workshops, info/tips on Toaster 4000 and System 3.1. Call: Andrew Timmins, (408)243-9233 (eve.). [Exp. #134.]

WINDOWS

BMUG Windows SIG. Meetings: 1st Tues., 6:30 pm, BMUG office, 2055 Center St., Berkeley. Call: Robin, (510)527-8993. [Exp. #137.]

SEF Windows SIG. Meetings: 1st Wed. (no meeting in Jan.), 6:30 pm, Cubberley Community Center, Room H-1, 4000 Middlefield Rd., Palo Alto. SIG of the Software Entrepreneurs' Forum. $15 for nonmembers. Call: Fran Finnegan, (415)288-4400. [Exp. #137.]

WIRELESS

SEF Wireless SIG. Meetings: 1st Mon., 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. A special interest group of the Software Entrepreneurs' Forum. Call: Patrick Glenn, (408)448-3844. [Exp. #133.]

ASSOCIATIONS

American Association For Artificial Intelligence. A technical society for those interested in Artificial Intelligence. 445 Burgess Dr., Menlo Park. Call: (415)328-3123, fax: (415)321-4457, email: membership @aaai.org or info@aaai.org . [Exp. #132.]

The Assembler Multitude. Meetings: every 3rd week on Mon., 7:30 pm, University Lutheran Church, 1611 Stanford Ave., Palo Alto. An open discussion of new technical developments in many fields and how they relate to nanotechnology. Call: (408)974-6241. [Exp. #134.]

Association For Women In Computing. Meetings: 1st Wed., 6:00 pm, Sinbad's Restaurant, Pier 2, San Francisco Embarcadero. $12 members, $14 guests. Call: (415)979-8450. [Exp. #134.]

Bay Area Sysop Alliance. Meetings: monthly. Help and information for Bay Area BBS systems. To get a BASA notice every month send a message to Jeff Hunter at jhunter@netcom.com with your Internet address, or send your FidoNet address to Jeff Hunter @ 1:161/211. [Exp. #132.]

Bay Area Video Coalition. A place for independent videomakers to communicate with each other and the larger media community. $10 for nonmembers. Call: Anne Etheridge, (415)861-3282. [Exp. #137.]

Black Data Processing Associates, Silicon Valley Chapter. Meetings: 4th Thursday, 6:30 pm, Amdahl Corp., Bldg. H, 1240 E. Arques Ave., Sunnyvale. National network of DP professionals, educators, students, and vendor reps. Call: Willie Mackey, (408)280-7624. [Exp. #137.]

Business Marketing Association. Meetings: 4th Wed., 11:30 am, Marriott Hotel on Great America Pkwy., Santa Clara. A professional organization for business-to-business marketing professionals; CBC certification, topical programs, seminars, job bank. Call: (408)365-9815. [Exp. #137.]

Center For Software Development. 111 West Saint John, Ste. 200, San Jose. A nonprofit corporation whose goal is to help software businesses grow and bring better products to market more rapidly. Call: (408)494-8378. [Exp. #133.]

Computer Professionals For Social Responsibility/ Berkeley Chapter. Meetings: last Sun., 3:00 pm, BMUG Offices, 2055 Center St., Berkeley. Meetings are open to the public and free. Call: Karen, (510)987-0567 or cpsr-berkeley @cpsr.org . [Exp. #137.]

Contra Costa Networking Forum. Meetings: monthly. Creating an electronic community network in Contra Costa County. Call: TEIRNET, (510)689-6016. [Exp. #133.]

Electronic Personal Memory Organizer Development Society. Meetings: 2nd and 4th Tues., 7:40 pm, Mr. Q's, 25 Main St., Tiburon. Free introductory exchange for electronics engineers, investors, and all interested parties. Call: 1-800-386-3477. [Exp. #133.]

Foresight Institute. Meetings: 123 Fremont Ave., Los Altos. Information about and discussion of nanotechnology and other anticipated technologies. $35 annual membership. Call: (415)917-1122. [Exp. #132.]

Historical Computer Society. 10928 Ted Williams Pl., El Paso, TX 79934. A nostalgia group for enthusiasts of older computers and their history. Main forum is Historically Brewed newsletter; $18/yr., $3 sample. Call: David A. Greelish, (915)822-2683. [Exp. #133.]

IEEE San Francisco Computer Society. Meetings: monthly, SF State University. Call: (415)905-4400. [Exp. #133.]

Independent Computer Consultants Association, Northern California Chapter. Meetings: 2nd Tues., 6:00 pm, The City Club, 155 Sansome St., San Francisco. Open discussion, questions and answers. Call: (415)399-0305. [Exp. #137.]

Nanosystems Study Group. Meetings: every few months, 7:30 pm, Genentech Conference Center, Bldg. 5, South San Francisco. Call: Ted Kaehler, (408)974-6241. [Exp. #132.].

North Bay Multimedia Association. Meetings: 3rd Thurs. (but September's is on 22nd), 6:00 pm, Indian Valley Campus, Pomo Cluster, Novato (101 to Ignacio Blvd., go west into campus, park in lots 3 or 4). $10 for nonmembers, $75/year membership. Call: Sharon Rockey, (415)721-1780. [Exp. #132.]

North Bay Systems Professionals. Meetings: 3rd Wed., 6:00 pm networking, 7:00 pm dinner, 8:00 pm speaker. Embassy Suites Hotel and Conference Center, 101 McInnis Parkway, San Rafael. NBSP provides a forum for systems professionals to grow and to benefit from a network of other like professionals. Call: (415)721-4409. [Exp. #132.]

Rexx Language Association. A consortium of those who deal at some level with the Rexx language. For membership info send name and address to pjt@wrkgrp.com or RexxLA Membership, 6300 N. River Rd., Ste. 501, Rosemont, IL 60018; fax (708)696-2277. [Exp. #132.]

Smart Valley Breakfast Talks. Meetings: 3rd Tues., 7:30 am, Anderson Consulting Center for Strategic Technology in Palo Alto. Talks focus on topics relating to the information superhighway. $5 for nonmembers. Call: (415)843-2160, email info@svi.org . [Exp. #132.]

Society For Technical Communication, San Francisco Chapter. Meetings: 3rd Wed., 6:00, program at 6:45 pm, Stagecoach Restaurant, 44 Montgomery St., San Francisco. Job listings, guest speakers, technical publications competition, newsletter. Call: (415)985-7121. [Exp. #133.]

Society For Technical Communication, Silicon Valley Chapter. Meetings: 3rd or 4th Thurs., 5:30 pm refreshments, 6:30 pm dinner, 7:15 dessert. Sunnyvale Hilton, 1250 Lakeside Dr. (off Lawrence Expressway at 101). Guest speakers, special interest groups, networking, job listings, newsletter. Call: (408)737-9426. [Exp. #137.]

Software Entrepreneurs' Forum. Meetings: 3rd Wed., 6:30 pm, Elk's Lodge, 4249 El Camino Real, Palo Alto. Industry association dedicated to software developers and entrepreneurs, offering information and education on all facets of the software industry. Call: Barbara Cass, (415)854-7219. [Exp. #137.]

Family History On The Net

continued from page 96

genealogical program that understands GEDCOM. But he can't format the book, unless he also gets copies of various ancillary Makefiles, shell scripts, etc. and essentially duplicates the environment on the master machine. Even then, he would have a duplicate, which leads to consistency problems between the two instantiations of the database that interactive remote access to a single master copy does not have.

Net Vs. Mail

So here you can see a practical illustration of the difference between what you can do with the Internet's interactive resource sharing protocols and what you can do if you only have electronic mail.

Sure, theoretically Patrick could send pictures by mail and we could send the formatted book back that way, but in practice it ain't gonna happen. And there's no way he could log in by mail onto the computer with the database and directly format the book and interactively examine the source files and the output. Internet access is not just faster than mail-only access to the rest of the Matrix, Internet access is qualitatively different in large, clear, and important ways.

Now, this is not to say that CompuServe does not have its advantages: it does. For example, there is a CompuServe genealogy forum, with participants in asynchronous conferencing from around the world. On that forum Patrick found a researcher in Maryland who helped us follow up a lead on some possible ancestors. He has also gotten software off of CompuServe that has been of use in his enhancements of the photographs, as well as advice on which techniques would be most useful. He says he got the most help from the mail various people send back and forth.

We've also found Prodigy useful, because another cousin has a Prodigy account, and he answers his mail. CompuServe and Prodigy have large audiences for conferencing and are useful sources of software and other files. But for a project such as this Quarterman family history that requires distributed access to remote computing resources, CompuServe and Prodigy are not practical; you can't use either one to log in on another subscriber's computer. And for frequent exchange of large specialized files, they're just too expensive, because they charge by size of transfer, not by bandwidth. For resource sharing you can't beat the Internet.

It will be especially interesting to see what happens with online genealogy now that people are starting to adapt genealogical databases to the World Wide Web. After all, few types of information are more adapted to hypertext: every family relationship is a potential Web link. It's already trivial to dump a GEDCOM database into a set of html files, one per person. This method provides only static links, however. Look for Web genealogy using a database engine like LifeLines to generate links on the fly. Some examples are already available; see http://www.tic.com/ gen.html . ■

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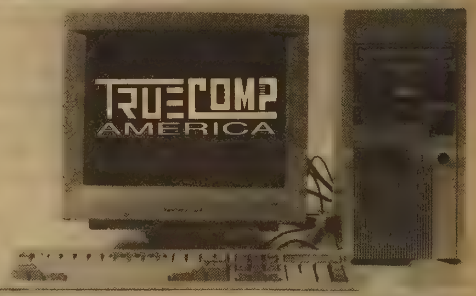

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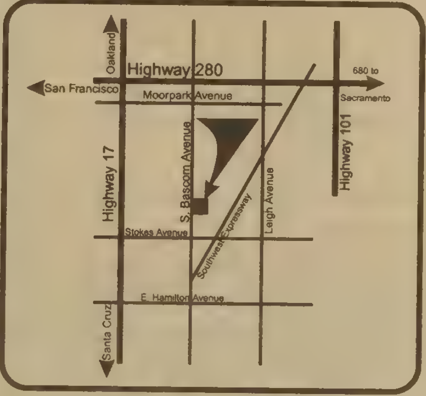

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that Karraker's removal was due to Branham's claim. She protested loudly that it had nothing to do with her. Yet in a letter from Agrella to Karraker, Agrella states: "Although the initial remedy sought by the claimants included your dismissal as an employee, a review and analysis of the Education Code did not allow the College the prerogative of pursuing this action as a portion of settlement." It seems clear that Branham did not merely want Karraker's temporary removal, she wanted to end his career.

Most puzzling of all was the payment to Humphrey. The OCR found the college innocent of all his charges, yet SRJC paid him $15,000 anyway.

The Aftermath

The OCR ruling was released in September of 1994. About six weeks after the ruling came out, SRJC implemented the OCR guidelines regarding "online conduct"—i.e., words, for there is no way that physical action can take place online, nor were any physical threats ever posted on SOLO.

The loss of the WOC has left many online women bitter. None of the members of the WOC agreed that the conference was discriminatory; they feel they've been punished unjustly by some suit-happy malcontents with ulterior motives.

> The OCR threatened to withhold federal funds if SRJC did not knuckle under to its demands. The rules of conduct that the OCR insists upon include fuzzy regulations which forbid "acts that purport to be 'jokes' or 'pranks,' but that are hostile or demeaning."

SRJC English instructor Marco Giordano, Computer Coordinator for the English lab, had been working on establishing a small network in the English department's Mac lab. He intended to use it to give English students an opportunity to discuss Toni Morrison's *Beloved*, but abandoned the project when the OCR report came out. Giordano admits that he was encountering some difficulties with hardware and software, but adds that "the lack of clear campus guidelines in relationship to this proposed BBS put the final nail in the coffin of the bulletin board. It seems to me that people are leery; they're wondering where their freedom of speech is going to land them now."

On November 4, 1994, Branham filed a new complaint against the college. Branham and Humphrey objected that they could not defend themselves against online students since they did not have SOLO accounts. They were both given accounts on November 7, 1994, yet they continue to "lurk" (spend time online reading but not posting). Neither of them has made the slightest effort online to explain their position.

Since then there has been an uncomfortable chill on SOLO. Students are anxious that what they might post in jest could be taken as insult. Some students have tried to start up the debate again, but most who were around during the onset of the brouhaha have been silent, fearful of stirring up yet another tempest in the SRJC teapot.

A small section of SOLO, which was accessed via modem by children from various grammar and junior high schools in the area, has been closed down by SOLO administrators. The stated reason was that "the learning objective had been met," but it is clear that fear of another claim lay behind this decision. Though the SOLO kids could not access the adult conferences, they could engage adults online in real-time chats. Despite the fact that these chats were forbidden by SOLO administrators, some students disobeyed the rules. As Karraker has said, "There was no way to make it bulletproof."

Lauren Chroninger, a thirteen-year-old student in Rohnert Park, had her first experience with BBSes through SOLO. She expresses quite clearly what she learned from her excursion into cyberspace, and her sadness at its closure: "You could express your ideas, your thoughts, and what your likes and dislikes are. Your opinions could be easily changed if you listened to other kids' input on them instead of grownups' input... You meet new people. You solve conflicts that go on in the chat room. You learn about something from the people around you, and you learn things about yourself... I have lost many friends because of this [closure] and I hope that sometime in my life I will meet up with the people I met on SOLO. Maybe then we will catch up with each other on the years that were robbed from us, when we could have been communicating."

This thirteen-year-old obviously understands that speaking out, addressing differences, and wrangling out the problems is a far better solution than telling people to shut up and sit down. If only this concept could be grasped by some of the adults around here...■

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nontechnical artists and musicians to create computer-oriented 'content.'" Thus began MacroMind, which eventually moved to San Francisco in 1988.

INTERACTIVE MUSIC

Canter traces the history of interactive, computer-mediated music through Jaron Lanier's "Moondust" for the Commodore 64; to another Commodore 64 product called Music Maker ("a thing you could type notes into and it would actually play back, but it wasn't as dumb as a music construction kit because it had some smarts in it. It was like smarts with data; as I'm playing the thing it knows I've been through it three times so on the fourth time it would go over here."); to "Jam Session" created by Ty Roberts, Ed Bogas, and Steve Capps. Canter identifies the crucial point as "video games are one way to let people have control, but there's a lot of other ways."

Of course any discussion about interactive music eventually gets around to Todd Rundgren; Canter did have a partnership with him for a while. Together they worked out some principles of interactive music that Canter still keeps on a list taped to his computer. The basic tenets they agreed on were that everything is impermanent, not cast in stone; that they're dealing with interactive music, not improvised music; that there should be extensibility to the system; and that there should be conservative use of resources, with reusability of features and templates. After Rundgren split, Canter worked out three further considerations: scalability, adaptability, and compatibility with other systems. Canter sums up his goal as "I want to create a new type of technology, and that technology is multiple-user, real-time performance software."

They began work together on the practical aspects of the task with auditions for the MediaBand, held poolside at San Francisco's Phoenix Hotel in April and May of 1992. They chose three other band members. One of Canter's endearing features is his openness about money and he laughs as he asks, "What's the best way to tell if your bandmembers are loyal? Stop paying them. The first guy to leave was Todd. He has a $700,000 a year overhead that he needed to cover. Anyway, two of the four band members left." ■

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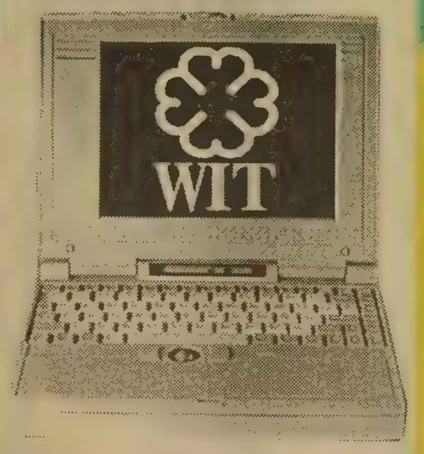

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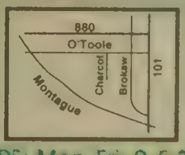

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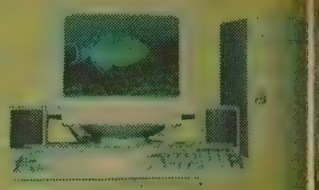

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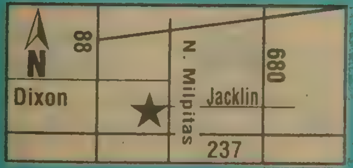

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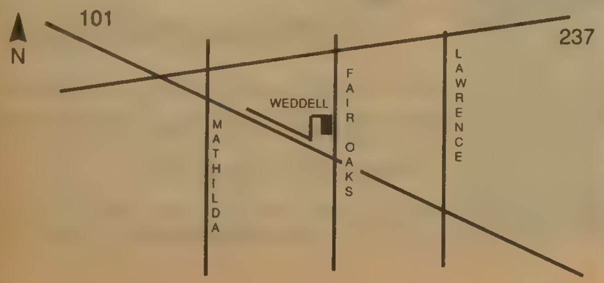

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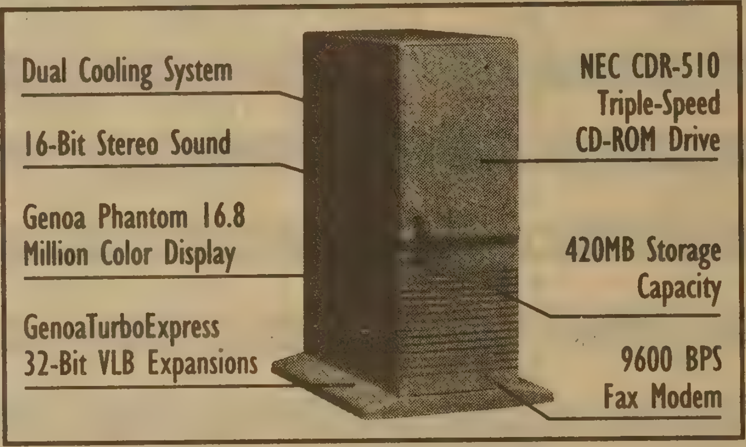
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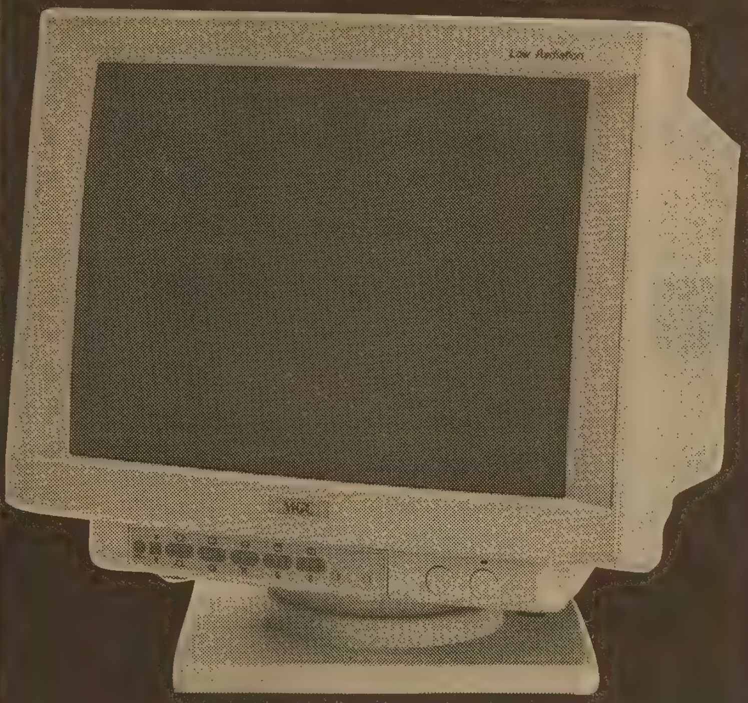

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Intel 486DX-33	**$898**
Intel 486DX2-66	**$968**

PACKAGE 2 SYSTEM

486 VLB Series

- ☑ SIS-471 Motherboard w/ CPU (256K Cache)
- ☑ 4Mb Ram installed (72-pin)
- ☑ IDE Controller VLB 2HD & 2FD w/ 2s, 1p, 1g
- ☑ Floppy Drive 1.44Mb
- ☑ Hard Disk 420Mb IDE 12ms
- ☑ **Spider+ Window Accelerator VLB w/1Mb**
- ☑ **14" Acer 34T SVGA Color Monitor (1024x768) .28 NI**
- ☑ 101 Keys Enhanced Keyboard
- ☑ Mini Tower Case w/ 230 Watts Power Supply
- ☑ **Free 3 Buttons Serial Mouse**

Cyrix 486DX2-50	**$928**
AMD 486DX-40	**$978**
AMD 486DX2-66	**$998**
AMD 486DX2-80	**$1,018**
AMD 486DX4-100	**$1,158**
Intel 486DX-33	**$948**
Intel 486DX2-66	**$1,008**

PACKAGE 3 SYSTEM

486 VLB Series

- ☑ SIS-471Motherboard w/ CPU (256Kb Cache)
- ☑ 4Mb RAM Installed (72-pin)
- ☑ IDE Controller VLB 2HD & 2FD w/ 2s, 1p, 1g
- ☑ Floppy Drive 1.44Mb
- ☑ Hard Disk 420Mb IDE 12ms
- ☑ **Orchid Celsius VLB w/ 1Mb VRAM**
- ☑ **15" Acer 56L SVGA Color Monitor (1024x768) .28 NI**
- ☑ 101 Keys Enhanced Keyboard
- ☑ Mini Tower Case w/ 230 Watt Power Supply
- ☑ **Free 3 Buttons Serial Mouse**

Cyrix 486DX2-50	**$1,058**
AMD 486DX-40	**$1,108**
AMD 486DX2-66	**$1,128**
AMD 486DX2-80	**$1,148**
AMD 486DX4-100	**$1,288**
Intel 486DX-33	**$1,078**
Intel 486DX2-66	**$1,138**

PACKAGE 4 SYSTEM

486 PCI Series

- ☑ Biostar PCI w/ CPU (256Kb Cache)
- ☑ 4Mb RAM Installed (72-pin)
- ☑ IDE Controller PCI 2HD & 2FD w/ 2s, 1p, 1g
- ☑ Floppy Drive 1.44Mb
- ☑ Hard Disk 420Mb IDE 12ms
- ☑ Windows Accelerator PCI w/ 1Mb
- ☑ 14" Super VGA Color Monitor (1024x768) .28 NI
- ☑ 101 Keys Enhanced Keyboard
- ☑ Mini Tower Case w/ 230 Watt Power Supply
- ☑ **Free 3 Buttons Serial Mouse**

Cyrix 486DX2-50	**$958**
AMD 486DX-40	**$1,008**
AMD 486DX2-66	**$1,028**
AMD 486DX2-80	**$1,058**
AMD 486DX4-100	**$1,188**
Intel 486DX-33	**$978**
Intel 486DX2-66	**$1,048**

PACKAGE 5 SYSTEM

Pentium PCI Series

- ☑ Intel Motherboard w/ CPU & Heatsink (256Kb Cache)
- ☑ 8Mb RAM Installed (72-pin)
- ☑ IDE Controller PCI 2HD & 2FD w/ 2s, 1p, 1g
- ☑ Floppy Drive 1.44Mb
- ☑ **Hard Disk 540Mb IDE 12ms**
- ☑ **Windows Accelerator PCI w/ 1Mb (S3-864)**
- ☑ **15" Acer 56L SVGA Color Monitor (1024x768) .28 NI**
- ☑ Keytronic 101 Keys Enhanced Keyboard
- ☑ Mini Tower Case w/ 230 Watt Power Supply
- ☑ **Free Microsoft Serial Mouse (Ergomonic)**

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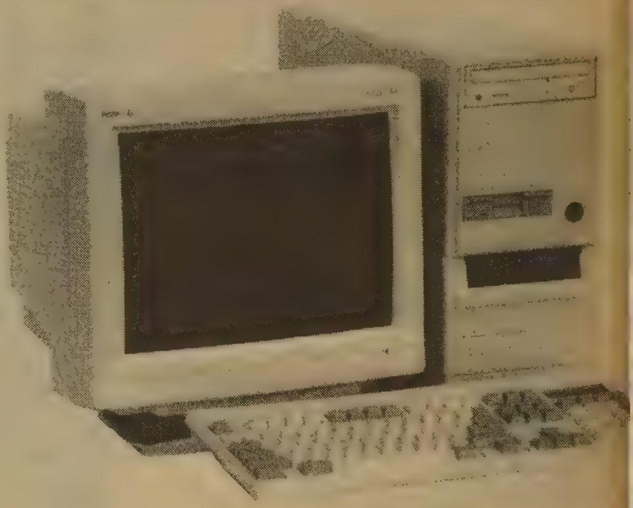

- ✱ SIS-471 Motherboard w/ CPU (ZIF socket)
- ✱ 256K Cache
- ✱ 4Mb Ram installed (72-pin)
- ✱ IDE Controller VLB 2HD & 2FD w/ 2s, 1p, 1g
- ✱ Floppy Drive 1.44Mb
- ✱ Hard Disk 420Mb IDE 12ms
- ✱ Spider 256 windows accelerator VLB w/ 1Mb
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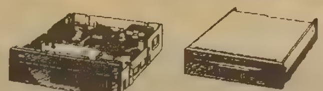

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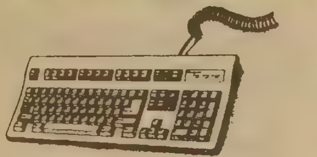

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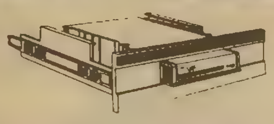

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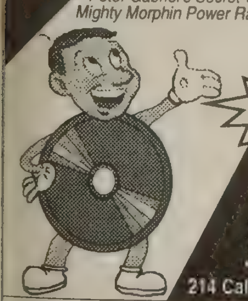

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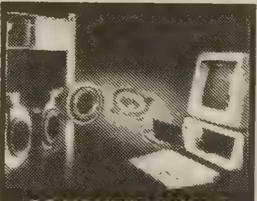

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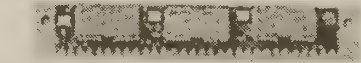

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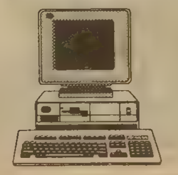

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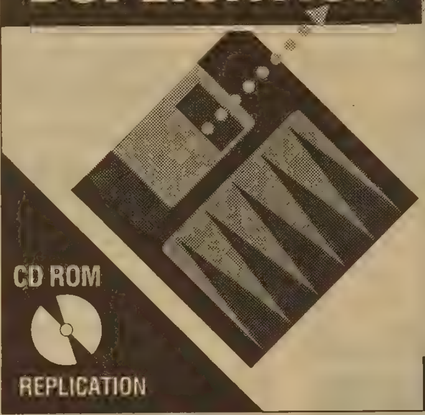

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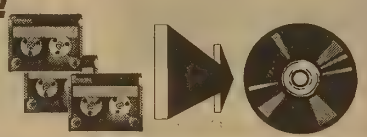

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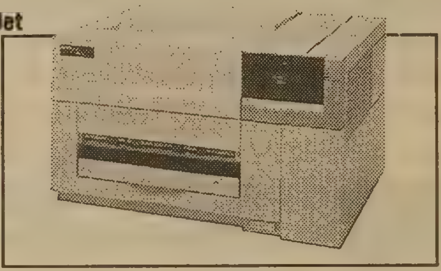

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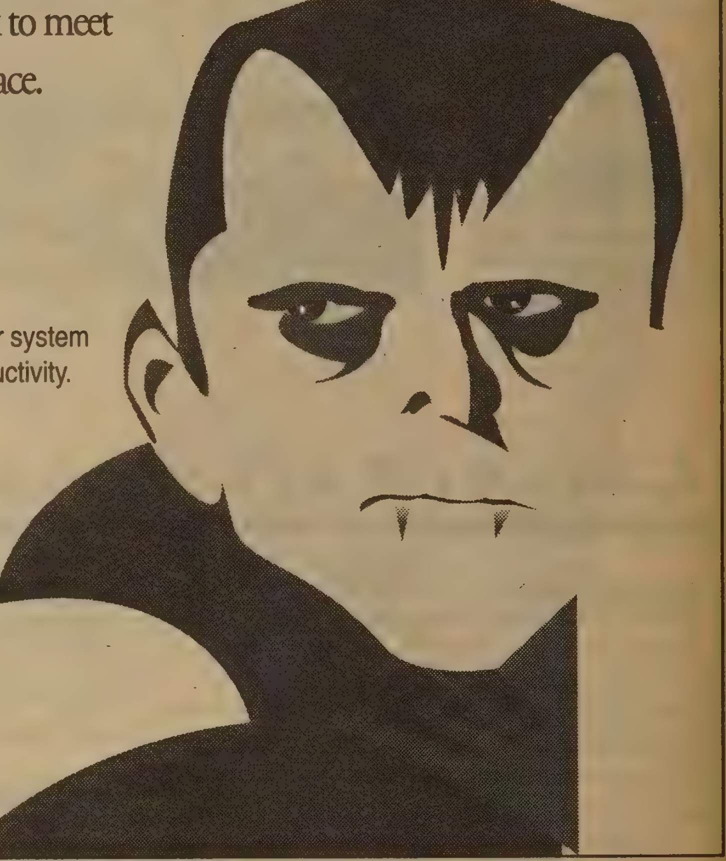

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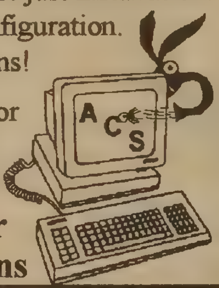

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continued from page 294

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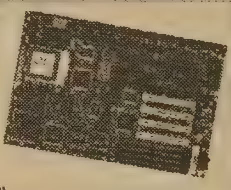

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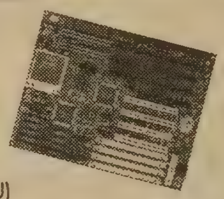

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Stealth 64 VLB or PCI w/2MB (S3-964)	$278
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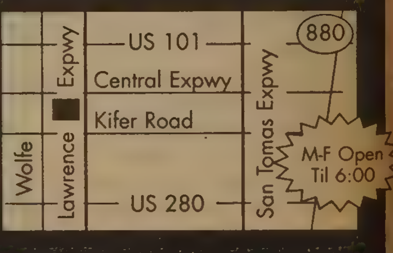

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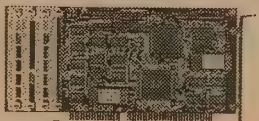

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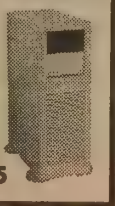

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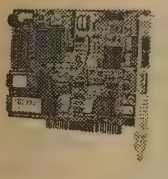

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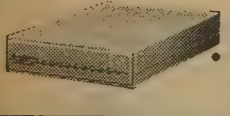

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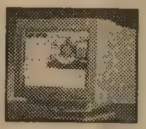

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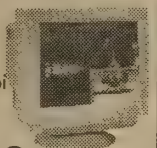
- Flat Screen



$879

ViewSonic-17G 1280x1024 . . . . $765

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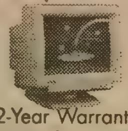
14" SVGA .28mm dot pitch



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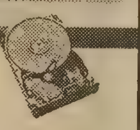

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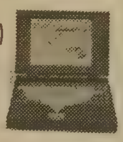

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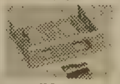

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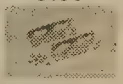

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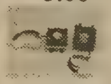

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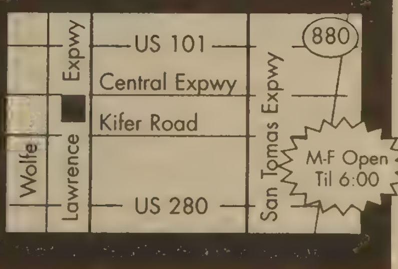

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- Maxtor 546MB Enhanced 11MB/sec IDE
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Matrox Imp. II+ /2MB
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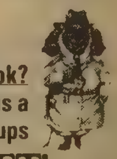

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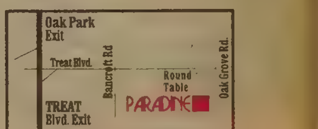

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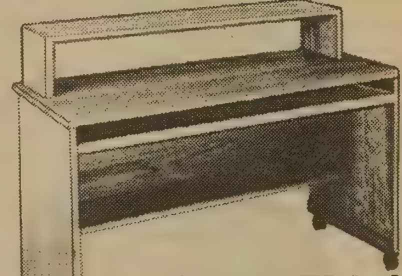

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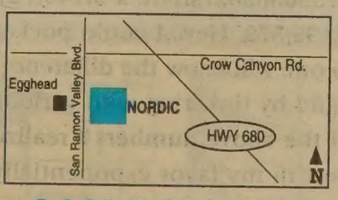

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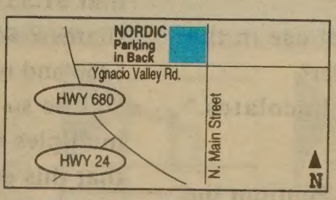

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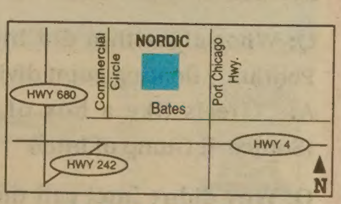

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The Pentium Debacle Redux
or
The Jokers Went Crazy On The Net With This One

It began with the announcement by Intel that the Pentium had a minor bug. It meant the chip's floating point unit was flawed. A lot of excuse-making was done by Intel, and one stock analyst said it would blow over in a day. I decided not to go with any of that guy's stock tips.

The Internet lit up with joke files. Here are some of the best ones I've picked off and some comments sent to me by friends.

Q&A: THE PENTIUM FDIV BUG

Q: How many Pentium designers does it take to screw in a lightbulb?
A: 1.99904274017, but that's close enough for nontechnical people.

Q: What do you get when you cross a Pentium PC with a research grant?
A: A mad scientist.

Q: What's another name for the "Intel Inside" sticker they put on Pentiums?
A: The warning label.

Q: What do you call a series of FDIV instructions on a Pentium?
A: Successive approximations.

Q: Complete the following word analogy: Add is to Subtract as Multiply is to:

1) Divide
2) Round
3) Random
4) On a Pentium, all of the above

A: Number 4.

Q: What algorithm did Intel use in the Pentium's floating point divider?
A: "Life is like a box of chocolates." (Source: F. Gump of Intel)

Q: Why didn't Intel call the Pentium the 586?
A: Because they added 486 and 100 on the first Pentium and got 585.999983605.

Q: According to Intel, the Pentium conforms to the IEEE standards 754 and 854 for floating point arithmetic. If you fly in aircraft designed using a Pentium, what is the correct pronunciation of "IEEE"?
A: Aaaaaaaiiiiiiiiiieeeeeeeeeeeee!

A Letter from Konstantinos M. Lahanas, Ph.D.

I woke up on Thanksgiving Day after having a dream, a very vivid dream on how owning a Pentium can make me very rich.

Let's say I'm administering a stock fund and I have to distribute $4,195,835 in dividends to...oh say 3,145,727 shares among investors. I grab my trusty $2500 Pentium equipped computer and figure that each should get $4,195,835/3,145,727= 1.333739068902 dollars per share.

Q: What algorithm did Intel use in the Pentium's floating point divider?
A: "Life is like a box of chocolates."
(Source: F. Gump of Intel)

Being a stickler for numbers, I realize that $1.333739068902/share x 3,145,727 shares = $4,195,579. Hey...I could pocket $256 and no one will know the difference. So I do so, and by tinkering with various multiples of the above numbers I realize that this error in my favor exponentially increases as long as both numbers are multiplied by a power of two.

So I divert money and shares from all funds in my other portfolios into one fund until the total dividends and shares are a large multiple (say 1024) of the above numbers and presto, I've got $262,144. Now of course I don't work alone, and this student intern we've got, with a boat anchor 286, stumbles onto what's happening. The full-time guys all got Pentiums so they can't do math, either.

So then I found myself in court and telling the judge, "Hey it's just a coincidence. Intel says this kind of thing happens only once in...I don't know...27,000 years!!! I've got a technote to prove it."

I then woke up in a cold sweat.

Of course most people, according to Intel, don't do this kind of high-level complex math, they just buy Pentiums to run Doom. Just like my story wouldn't fly, neither will Intel's.

FAKE NEWS STORY

TOP TEN NEW INTEL SLOGANS FOR THE PENTIUM

9.9999973251 It's A FLAW, Dammit, Not A Bug
8.9999163362 It's Close Enough, We Say So
7.9999414610 Nearly 300 Correct Opcodes
6.9999831538 You Don't Need To Know What's Inside
5.9999835137 Redefining The PC— And Mathematics As Well
4.9999999021 We Fixed It, Really
3.9998245917 Division Considered Harmful
2.9991523619 Why Do You Think They Call It *Floating* Point?
1.9999103517 We're Looking For A Few Good Flaws
0.9999999998 The Errata Inside
0.9999999994 Intel Inside, But Can It Divide?

Random Comment

I guess Intel will soon announce the 586DX, a Pentium-class chip with a working FP unit. They will also announce that the current Pentium chips are *really* 586SX chips, so the floating point was not supposed to work in the first place.

And just think. This was just the first round of jokes!

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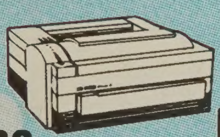

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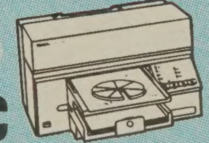

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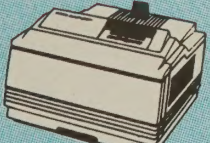

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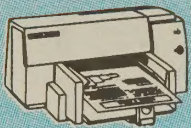

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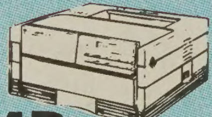

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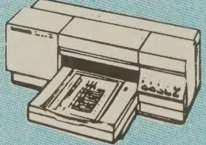

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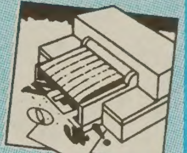

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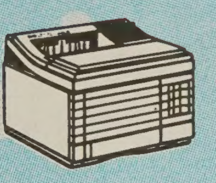

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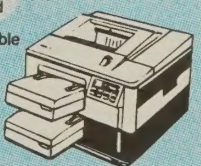

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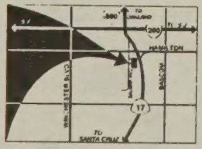

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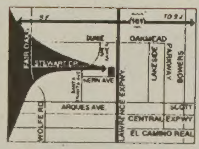

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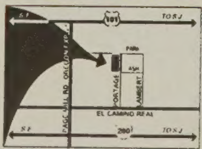

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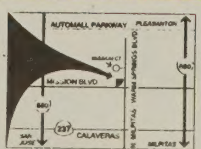

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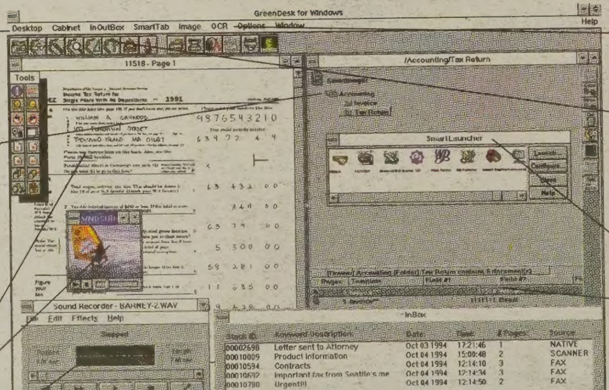

Stack ID	Keyword Description	Date	Time	# Pages	Source
00002698	Letter sent to Attorney	Oct 03 1994	17:21:46	1	NATIVE
00010009	Product Information	Oct 04 1994	15:00:48	2	SCANNER
00010594	Contracts	Oct 04 1994	12:14:10	3	FAX
00010692	Important fax from Seattle's me	Oct 04 1994	12:14:34	3	FAX
00010780	Urgent!!!	Oct 04 1994	12:14:50	2	FAX

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